Citation: Kozlowska, Agnieszka (2014) Taking Photographs Beyond the Visual: Paper as a Material Signifier in Photographic Indexicality. Doctoral thesis, Northumbria University.

Taking Photographs Beyond the Visual: Paper as a Material Signifier in Photographic Indexicality

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PhD

Volume 1 of 2

2014

Taking Photographs Beyond the Visual: Paper as a Material Signifier in Photographic Indexicality

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A thesis submitted in partial fulfilment of
the requirements of the University of
Northumbria at Newcastle for the degree
of Doctor of Philosophy

Research undertaken in the School of
Arts, Design and Social Sciences

Volume 1 of 2

January 2014

Abstract

Despite the fact that photographs come into being as material objects imprinted with light reflected off the subject in front of the camera, and therefore possess a decidedly physical connection to their referent, the materiality of photographs tends to be overlooked in favour of apprehending them as primarily visual signs independent of their physical support.

This practice-led research project under the title *Taking Photographs Beyond the Visual: Paper as a Material Signifier in Photographic Indexicality* explores the status of photographs as physical traces. In an attempt to find ways in which remote natural locations could be expressed more fully than it is possible by means of purely visual representation, papermaking and image-formation are combined in a single process executed entirely on-site.

This working method was developed during the course of the project through artist residencies in Switzerland and a thorough research of traditional papermaking that included visits to numerous European paper mills. The making of each work involves an absurdly laborious and time-consuming process of hiking to an alpine location, making paper on-site from local plants and - using only the inherent light-sensitivity of plant substances - exposing it for many days in a camera built there partly from found natural materials.

The resulting photographic objects function as pure indices in the semiotician Charles Sanders Peirce’s understanding of the term – as traces that point to their causes without necessarily revealing anything about the nature of the latter. They are artefacts testifying primarily through their presence, rather than through pictorial representation, to the exposure having taken place. Such process of signification requires the viewer’s active, haptic and imaginative response. The work proposes a way of photographically representing place as elemental - that is, existing outside the human schema of production, consumption and meaning – instead of through such cultural constructs as ‘landscape’ or ‘the scenic’.

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Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

Ethical clearance was not required for this research by the School Ethics Committee.

Agnieszka Kozlowska

Signature:

Date:

Introduction

I am an avid mountain hiker. Despite my training as a photographer, however, I have no desire to capture my experience of interacting with the surrounding world in a photographic image. When I walk, I am acutely aware of the way I use sight as a tool, on a par with and inseparable from the other senses, for locating the body in space. The perception of the environment, moreover, encompasses both the visible as well as that which I know to be there – the valley behind that mountain, the next mountain range, etc. There is at all times a sense of the larger topography and my position within it, and this space is *felt*, through all the senses, as an extension of my body rather than simply being *seen* as external to it. As Maurice Merleau-Ponty has argued, "vision and orientation stem from the body's motility, actions, and tactile senses, which produce a 'lived experience' of being absorbed in the spaces and intertwined with the objects one sees" (in Boetzkes, 28). Furthermore, my repeated interaction with an area – walking again and again up the same valleys, over the same passes, but each time in a different weather and at a slightly different time of year – creates a sense of intimate familiarity with the land and of measuring its expanse with my own body. The question of how photography, a medium of producing pictorial representations, can convey the complexity of such an embodied perception of ones' surroundings is central to my artistic practice.

During photographic exposure, light reflected off the subject falls through the lens and induces changes in the photosensitive surface. This physical and causal link between the subject and the material of a photograph has been referred to since the 1960s in writings on photography using the term 'indexicality', adopted from the semiotics of Charles Sanders Peirce and indicating a direct rather than arbitrary connection between a sign and its referent. This unique relationship creates potential for the medium to produce artefacts that testify through their physical presence, rather than pictorial representation, to the exposure having taken place. Being primarily sensed rather than 'read' as images, such entities open up a possibility for representing what some cultural geographers have termed the 'more-than-human', sensuous dimensions of our interaction with the physical environment (Lorimer 2005). On the other hand, when considered only as images, despite their apparently immediate, natural and non-mediated relation to what they represent, photographs function as culturally coded signs that operate in a sphere of meanings that are entirely human. They can be characterized by analogy with written signs, which the philosopher David Abram describes as functioning in a seemingly autonomous, mental dimension abstracted from the sensuous world (1997). The latter, however, can be better thought of as 'elemental' – a term proposed by John Sallis in a philosophical

> turn toward that in nature that exceeds nature, toward that which, itself of nature, is nonetheless beyond the things of nature to such an extent as to constitute the encompassing elements within which, coming to pass, things show themselves (2000, 24).

Locating this research in the Alps as a site that was largely influential in shaping the cultural notion of nature is of particular significance. Through a sustained practical investigation, I endeavour to use photography as a mechanism for creating conditions for place as elemental to manifest itself without being limited to visual signs. To this end, I extend the definition of 'making photographs' to include not only the act of photographic exposure but also the creation of the sheet of paper that is being exposed. Moreover, I seek viewers' active participation in completing the act of representation through the use of their imaginations. The two processes – of production and reception – are the main foci of my inquiry into how photographs communicate meaning as physical traces of contact.

Despite the semiotic sense of 'indexicality' implying a mere quality of signalling – by way of a physical connection - without designating, the use of the term in theory of photography is dominated by discussions about pictorial qualities of photographs rather than their physicality. This is perhaps understandable since the use-value of photographs, as the inventors of the medium were at pains to stress, arguably lies in their quality of accurate pictorial representation, and in their reproducibility. As indices, photographs are considered to be objectively 'true' to their causes, which is to say that they are accurate pictorial representations of their referents. An insistence on the materiality of photographs could be therefore seen as fetishizing what the philosopher Walter Benjamin has called the 'aura' of an artwork which, as he argued, diminishes with the widespread use of photography and reproduction techniques (1968). The consequence of this primary role of photographs as carriers of visual information is that the objects that give them physical presence are often attributed no significance – they can be disposable (newspapers) or even be made to display one image one second and another the next (digital screens). Further, processes of photographic reproduction give rise to the prevailing impression that an image exists independently of its material base because it travels between surfaces such as those of a negative and of multiple prints (whether darkroom, offset, or other), or even changes from a set of electronic signals in a digital camera sensor, to a set of data on a hard drive, to a panel of pixels on a screen, to a printed page, etc. The speed and ease of these transitions, the change of size, tone and other properties only add to this conviction. The historical change in how images are perceived in abstraction from the material dimension is what prompted Benjamin in the 1930s to speak of the demise of the aura of artworks. Physicality of, for example, vernacular photographs is analysed in the context of anthropology or material culture studies in terms of the contribution of the material of the print to the reception of the image (e.g. Edwards 2009b). But this physical form, resulting from postproduction, is in many ways arbitrary to the referent and the moment of exposure. My aim is not to 'take' images from the world and 'bring' them back into the world in another form, which is how the action of making an exposure on a negative or a digital sensor, followed by producing a print, might be perceived. Rather, I strive for such a participation in the fluxes of the physical world that aligns the necessary materials and substances to create what is perceived and interpreted as a photograph – a physical trace of contact between the subject and the photographic object.

Strictly speaking, indexicality does not imply visual resemblance. Pictorial representation (or, in semiotic terms, iconicity) can be considered as the usual, but not necessary, consequence of photographs being indexical – that is, having a direct causal link to their referents. Indices are like footprints that testify to the event of someone's passage having taken place, or like smoke that indicates a fire. As indexical objects, photographs have the capacity to communicate meaning in an intuitive, non-conventionalised manner by referring to our direct physical experience rather than functioning purely as conventional signs, such as images, that require interpretation. This discussion can be set in the broader context of what is arguably a tendency towards an increasingly visual and disembodied interaction with the world whereby only visual signs are perceived as meaningful and the sensuous world is relegated to the role of a meaningless or accidental background. The philosopher Paul Virilio rightly equates the corporeal detachment characterizing audiovisual media with that of motorized travel. Perception of the wider environment in the Western world is nowadays more often than not mediated by a car-, train- or bus-window, or a computer or television screen. This contributes to seeing the sensuous surroundings entirely from a human perspective and in categories of a resource – a mindset that philosopher Martin Heidegger called 'Enframing' (1977). Yet, being a largely mechanical process producing physical traces, photography has the potential to go beyond signifying only from a human perspective and instead to create a possibility for revealing in the sense of the Heideggerian ‘bringing-forth’ – representing that which withholds itself from being known. This, however, on the condition that the photographic apparatus and materials are not, to use philosopher’s Vilem Flusser’s term, ‘programmed’ to represent the world from the human perspective by producing photographs that are immediately and exclusively read and understood as images (1983). A certain degree of subversiveness is required to circumscribe those ‘programmes’ that manifest, for example, as a perfectly black box of a camera or a uniform white surface of paper. When these are taken for granted it becomes difficult to see photography as simply a recording of light falling onto photosensitive surfaces that happens, in principle, independently of human intervention. It is in this understanding, however, that photographs can represent the more-than-human otherness that we come into contact with in our interaction with the sensuous world.

Over the course of the research project, I have worked towards establishing a method of producing photographs that would function as artefacts brought back from the places where they were made and testifying through their presence to the photographic exposure having taken place. I began by searching for a photographic process where the object present in the camera and exposed onto is the very same object encountered by the viewers - a direct index of that what was in front of the lens. Such a process preserves in the final piece the immediate physical link formed by light reflected off the subject and falling onto the photosensitive surface at the time of exposure, rather than allowing it to erode through the light (or electronic data) transfers when image is printed from a negative or a digital file in postproduction. The months spent experimenting with chemical substances have brought me face to face with what the anthropologist Tim Ingold speaks of as the unruly proclivities of matter (2010), and resulted in establishing a working direct positive process. Further, having started to produce works on-site in remote natural locations, I wanted to bring the photosensitive surface into contact with the environment rather than to isolate it in a technologically advanced camera, so that it would bear physical traces of the place beyond the photographic image. I therefore began to fashion primitive chambers out of natural materials, initially by digging holes in the ground, and later by building structures largely out of rocks. Subsequently, the material onto which photographs were exposed seemed the only element of the work foreign to the site, and I proceeded by looking for a method of making the paper itself out of each place that I aimed to represent. I have developed a method of making paper on-site out of grass collected there, but struggled to sensitize it photographically to obtain an image, despite months of trials and a number of processes tested out, including the one used previously on conventional paper. Eventually, I have arrived at the idea of utilizing the light-sensitivity of plant pigments present in the paper itself, unexpectedly achieving even greater immediacy between the referent and the photographic object. This, however, at the cost of extremely long exposures lasting weeks, the tonal difference constituting an image being usually barely discernible and the material remaining light-sensitive.

By testing out various installation possibilities in exhibitions throughout the project, I investigated the process of meaning-making in response to an index, and how it is shaped by a network of other, conventional signs that surround it. The footage I obtained while filming the process of making each piece produced on-site constitutes an especially valuable tool in this respect. Despite the connection of the plant paper to the site being self-evident, its perception as having been directly exposed photographically in this particular way relies on viewers having what Peirce called the 'independent knowledge of the circumstances of production' of an index. Conventionally, photographs can be recognized as such on account of the image, and the common knowledge about photographic processes. As soon as a photographic object does not conform to the collective idea of how a photograph looks like, however, it functions as a pure index the causes of which, as Peirce asserts, are not necessarily apparent. I explore ways of establishing the context for interpreting an index through the use of such signs as the information about location contained in the title of each photograph, its description as a photographic object made in this particular way, elements of an installation such as boxes and tables, and the film showing my interaction with the environment while making the photographs. I consider viewers' role not only in terms of interpreting those signs and imagining the connection of each piece to the site (and my engagement with it while making the photograph), but also in terms of the physical involvement required, such as opening and closing the boxes containing the pieces. Moreover, the combination of objects and film examines the differences between the two radically opposite modes of signification: the indexicality of the objects and the iconicity of the (moving) image. While the objects evoke an embodied response without revealing anything about the nature of their referents, the film metaphorically transports viewers to the time and place it represents, creating an illusion of witnessing the depicted events first-hand. Yet, it can be edited not to document, but rather to be as ambiguous in relation to the photographs as they themselves are in relation to the sites – and to require an act of inference to be understood as depicting the events that the objects are the outcomes of.

The thesis structure follows, in many ways, the development of the artistic practice and the theoretical ideas that underpin it. It begins with the first chapter examining the arguments around photographic indexicality with the aim of putting into context my own intuitive understanding of photography as a physical trace-making process. Indexicality tends to be discussed in theory of photography in relation to pictorial resemblance rather than the status of photographs as physical traces, despite the fact that, strictly speaking, the latter is precisely what Peirce's semiotic term implies. The chapter is concerned not only with the indexical process of production of photographs, but equally with their reception as objects carrying a physical and causal relation to their referents.

The second chapter shows how those theoretical ideas informed the practical choices made while developing the work in this project. It traces what has been my continuous physical engagement with materials: from recreating a working direct positive photographic process, through researching traditional papermaking techniques and visiting papermills, developing camera-building and plant papermaking methods to be used on-site, making work in remote alpine locations, filming the process, to exhibiting the pieces and the films in a variety of installation formats.

The third chapter analyses the implications of the chosen methods of making photographs in a wider context. It introduces the concept of place as elemental (that is, existing outside of the sphere of meanings that are entirely human), as used by philosopher John Sallis, and proposes photography understood as a physical trace-making process as a suitable medium for attempting to represent it. Photographic technology is designed to produce meaningful visual signs in accordance with the established cultural codes of visual representation such as 'landscape' that frame the world entirely from the perspective of a disembodied spectator. It can, however – as is the intention of the chosen methods - be subverted in order to better reflect the experience of actively participating in the surrounding world as an embodied entity. In the process, properties of a photographic object other than pictorial representation - such as its physical presence, its materials and its surface - emerge as the primary carriers of meaning.

Finally, the fourth chapter examines the complexities around the reception of the photographic objects produced in this project. Having foregone pictorial representation, the works rely on viewers' sensuous engagement and conceptual understanding. Physical positioning of the pieces, the space where they are situated and the character and placement of information necessary to recognize them as photographic indices (for example, the film showing my interaction with the environment in the process of their making) all hugely influence the ways in which they signify. The chapter outlines the process of exploring these through studio practice and exhibitions held in the course of the project. Throughout, my argument is contextualised using theoretical concepts from a range of fields, including photography theory, art theory, semiotics, philosophy, anthropology and material culture, as well as through examples of other artists' work – not only photographic (Steven Pippin, Joan Fontcuberta, Abelardo Morrell) but also that which is predominantly sculptural and conceptual (Robert Smithson, Jean-Marc Bustamante, David Nash, Bruno Jakob, George Steinmann).

Chapter I. Photographs as material indices

Before writing about the artistic practice that lies at the heart of this research, it is necessary to propose why the semiotic concept of indexicality is important in thinking about photographs, and what are the consequences of fully applying it to the understanding of the medium of photography. The focus of this chapter is therefore on indexicality, limited to the context of photography, with the aim of critically assessing a wide variety of theoretical perspectives and clarifying my position on this subject. I wish to argue that after separating indexicality from the issues of iconicity it is so strongly associated with in the medium, the physicality of photographs emerges as necessarily implicated in the process of their becoming, while their status as pictorial representations can be seen as merely optional. This argument forms the basis for the artistic practice, since it explicates and puts into context my intuitive understanding of photography that is embedded in my activity as an artist more generally. I feel it is important to familiarize the reader with the issues dealt with in this chapter from a theoretical perspective before discussing how my practice contributes to those debates. The following chapters explore through the prism of my work how, why, and to what effect photographs can signify as indices – as physical traces of their referents. However, contrary to what this chapter order might suggest, the work in this project did not develop as an illustration of the theoretical argument. It has arisen from the concerns presented in this chapter and brought to them new and unexpected insights.

The concept of indexicality belongs to the model of semiotics developed by Charles Sanders Peirce, as opposed to the other of the two major models – and for a long time the dominant one - that of Ferdinand de Saussure. The significance of this fact goes beyond considerations of indexicality itself. Saussure's semiotics is based on linguistics, and an element of cultural convention is always involved in his notion of a sign (I will be using in this context the term 'coded', key amongst post-Saussurean semioticians such as Barthes). Peirce's model, on the other hand, includes non-arbitrary, causal signs that are interpreted based on experience, or even without conscious thinking on the part of the interpreter. To begin to think about representing place as elemental - that is, existing outside of the human sphere of meanings - it is necessary to recognize that meaning-making can take place outside of cultural conventions. As objects, photographs signify in ways other than purely through the visual and culturally coded language of images. The process of signification varies between individuals, and there is always the possibility of signs to fail. This chapter is therefore concerned not only with the indexical process of production of photographs, but equally with their reception. The detailed analysis of photographs as indices and the development of this argument through the artistic practice might contribute not only to discussions about photography, but also to semiotic discourse on indexicality at large.

Peirce's concept of indexicality

The concept of indexicality was developed by Peirce in the later 19th century and not applied to the interpretation of art until the late 1960s, at which time it became a central notion for minimal and process art. This tendency is often traced to Rosalind Krauss' essay *Notes on the Index*, where she argued that the index "operates to substitute the registration of sheer physical presence for the more highly articulated language of aesthetic conventions" (81). However, as a number of critics have argued, James Elkins among them, Peirce's sign system "is extremely complex (…) and that complexity is entirely unused and unnecessary when speaking of photography" (2007b, 131). "Most applications of Peirce's semiotics to the interpretation of art utilize only a fragment of the earliest of his several typologies of signs", and "his description of three kinds of relations between signs and their objects (index, icon, and symbol) has been isolated from the rest of his semiotics" (Leja, 99-100).

The strenuous fit between Peirce's semiotics and photography is a consequence of the philosopher's interest in devising a system of logic (which has in view only the possible truth and falsity of signs) rather than in generating a semiotic typology useful for the analysis of visual arts. It is therefore not surprising that his references to images are "unsophisticated by later standards" (Leja, 115). As François Brunet demonstrates, photography comes up in Peirce's writing merely as an example for his theory, rather than a fully-fledged topic. Most often it serves as an illustration of the pragmatic coupling of icon and index, or of semiotic impurity of signs, but never as an example in passages where he expounds the definition of the index (2008, 34, 47). This in itself indicates the problems that lie in wait once indexicality is applied to photography. The following passage is most often quoted in relation to photography, although rarely in its full length:

> Photographs, especially instantaneous photographs, are very instructive, because we know that they are in certain respects exactly like the objects they represent. But this resemblance is due to the

> photographs having been produced under such circumstances that they were physically forced to correspond point by point to nature. In that aspect, they belong to the second class of signs [indices], those by physical connection. The case is different if I surmise that zebras are likely to be obstinate, or otherwise disagreeable animals, because they seem to have a general resemblance to donkeys, and donkeys are self-willed. Here the donkey serves precisely as a probably likeness of the zebra. It is true we suppose that resemblance has a physical cause in heredity; but then, this hereditary affinity is itself only an inference from the likeness between the two animals, and we have not (as in the case of the photograph) any independent knowledge of the circumstances of the production of the two species. (Peirce, CP 2.281[1])

Despite the 'unnecessary complexity' of Peirce's index in the context of photography, the passage highlights an important aspect of this category of signs that is rarely taken into account in discussions about photographic indexicality (except by François Brunet and Martin Lefebvre). A photograph's relationship to its referent is grounded in 'independent knowledge' – the same knowledge that makes us 'know that [photographs] are in certain respects exactly like the objects they represent' (notice the limited or relative character of photographic likeness underlined here). This 'independent knowledge' is central to my artistic practice, and I explore multiple ways of providing viewers with information external to the photograph itself, as will become clear in the following chapters. Brunet argues that photographs come into Peirce's argument precisely because of what 'we know' about them - around 1900 the knowledge of the 'circumstances of production' of photographs was widespread and unambiguous (Brunet, 42). While in 1844 Henry Fox Talbot felt he needed to add a printed note to each copy of *The Pencil of Nature* that read "The plates of the present work are impressed by the agency of Light alone, without any aid whatever from the artist's pencil", around 1900 Peirce could use references to photography by virtue of its obviousness, as *common knowledge* or even common sense (Brunet, 43). By 1980, however, when indexicality was used in the arts discourse, Brunet writes that

> this reference has become the marker of a new complexity of photography (…), claimed against a common knowledge or wisdom of photographic iconicity that was, by then, after not only Krauss and Roland Barthes but also Umberto Eco and Ernst Gombrich, largely regarded as provincial. … the Peircean reference functioned as an instrument (…) for the scholarly legitimization of conceptual practices and claims. (43)

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[1] Citations from Peirce's writings are designated as CP for *Collected Papers* and W for *The Writings of Charles S. Peirce*. Numbers refer to volume number, followed by page number.

In another often quoted passage: “The fact that [the photograph] is known to be the effect of radiations from the object renders it an index and highly informative” (CP 2.265), Peirce makes it explicit “that indexicality, far from being an immediate, ‘given’ feature of photographic experience, is indeed the consequence of our knowledge of photographs” (Brunet, 37) and how they are made. “It is this knowledge that makes them an index - not, therefore, the direct experience of it” (Brunet, 39). Readers, or viewers, together with their knowledge and experience, were considered by Pierce as one of the three elements, alongside the signifier and the signified, necessary for an interpretation of a semiotic sign to occur (he called this an *interpretant* – “not [directly] an interpreter, but rather the sense made of the sign” [Chandler, 29]). But this has not been the case in the competing model of semiotics conceived by Saussure (and based on linguistics) that influenced such thinkers as Barthes. It is therefore perhaps no wonder that the latter envisaged the status of photographs to be that of a ‘message without a code’, where “the relation of signified and signifier in quasi-tautological. … [and] there is a loss of equivalence characteristic of true sign-systems and a posing of a quasi-identity” (1985, 25). To the contrary, Peirce’s writing shows that the experience of looking at photographs is a highly educated and mediated one. The question of a degree to which this is the case is examined further on through the prism of my work that encompasses both making and reception of non-pictorial photographs.

Peirce’s ‘independent knowledge’ and semiospheres

The role of what Peirce called the ‘independent knowledge’ that viewers hold about the medium in the reception of photographs is worth exploring in more detail. Strictly speaking, “no object can have an inherent meaning or character of its own”, as the theoretician of material culture studies Susan Pearce has put it (xviii). Whenever something is identified as a painting or a photograph, it is a judgement based on what the philosopher Diarmuid Costello calls ‘divergent background beliefs’ (2009, 11), which are contingent on empirical history of the uses of each medium. Moreover, those beliefs are shaped by the context in which an object is perceived, such as an art gallery. As the curator Ralph Rugoff has written,

> our perception, far from being unmediated, is shaped by various kinds of filters, including our presumptions and assumptions, our cultural conditioning and personal history, and the institutional structures, both physical and immaterial, that shape our relationship to art (27).

Michael Leja has noted that what is missing from Peirce's semiotic theory is a mechanism for assessing semiotic relations and a notion of nested signs (116). He gives the example of Jackson Pollock's lines commonly seen as indices resisting the function of painted marks to depict or resemble, standing only as registrations of physical conditions that produced them (Bois and Krauss, 97). Within the aesthetic space of a picture frame or a gallery, however, a physical trace of a gesture becomes symbolic, as its intention can only be understood in reference to the history of painting. "Moreover", Leja argues, "as soon as they become recognizable as a trademark style, they have acquired an iconic aspect as well" (Leja, 119). An image will have a different meaning in different contexts, at different times, and so those contexts are themselves signs. Added to this is the infinite reproducibility of photographic images, whereby the same picture might appear on a variety of surfaces with entirely different material qualities: newspaper, photographic print, negative, digital screen etc. As Graham Clarke notes, "each change of context changes it as an object and alters its terms of reference and value" (19). A sheet of paper or a photographic apparatus constitute an aesthetic space within which traces become symbols whose interpretant (or content) is indexicality.

It is not clear to what extent we are able to recognize a photograph as a photograph because of how it looks like, and to what extent because it looks like what we know about the appearance of photographs in general. Perhaps we only automatically 'look through' photographs straight at their subjects because we know they *are* photographs and therefore have a direct causal relation to what they depict. Likewise, it might be that we have an interest in brushstrokes in a painting because we know they were made intentionally by the painter's hand. Artists constantly challenge those assumptions on viewers' part and therefore question the nature of their responses. For example, some of Chuck Close's portraits appear to be photographic, until one studies them up close or reads the description and discovers they are in fact painstakingly rendered by hand. Or, reversely, Jorma Puranen's photographs of landscapes reflected in a black-painted surface convincingly look like paintings until one learns they are photographs. My own work, which might evoke a whole variety of hypotheses as to how it was made, further investigates the dependence of viewers' response on their 'divergent background beliefs' and the judgment they made regarding its origin and production.

A realization that what one has assumed to be a painting is in fact a photograph could be called a transition between two semiospheres, to use the term coined in 1982 by the semiotician Yuri Lotman. A semiosphere is a semiotic space outside of which no semiosis, or meaning, can take place. For signs to have meaning, they have to exist in a certain semiosphere. Therefore, encountering an unfamiliar artwork, viewers call on their knowledge of other artworks and media to classify the object they are facing as a painting or a photograph, and make sense of it in relation to this knowledge. (Encountering the object in a gallery constitutes, of course, a larger semiosphere that allows viewers to assume it is an artwork.) It rarely happens that a *lack* of semiosphere can truly be experienced – a moment when we don't know anything – because, as the literary theorist Stanley Fish has argued, we tend to make meaning as soon as we can (1976, 478)[2].

It is because artworks are apprehended as objects rather than purely as images (even in case of representational media such as photography) that rectifying ones assumptions about the medium of a particular artwork is significant enough to justify talking about a change in semiospheres. Such a realization requires viewers to adjust not so much the knowledge of *what* is represented, but *how* it is represented (or: what *physically* constitutes an image). The experience of objects varies greatly from the experience of images. Consider this story, reported by Allan Sekula, of the anthropologist Melville Herskovits showing a Bush-woman a snapshot of her son. She was unable to recognize the image until the details of the photograph were pointed out. Sekula concluded that "the Bush-woman 'learns to read' after learning first that a 'reading' is an appropriate outcome of contemplating a piece of glossy paper. Photographic 'literacy' is learned" (1982, 85-6). It might also be said that the photographic image was a sign outside of her semiosphere (even though, it should be noted, the person it depicted was very familiar to her), and therefore its meaning as that of representing the person depicted could not be recognized[3].

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[2] Perhaps, as Chris Dorsett proposes, the brief moment of disorientation when a film ends and the lights come on in a cinema comes close to experiencing a gap between two semiospheres - that of the film and that of the reality inside the cinema (2012).

[3] This can also be analysed in terms of an image being not only an iconic, but also a symbolic sign – and therefore shaped entirely by conventions. Guy Cook argues that "for a sign to be truly iconic, it would have to be transparent to someone who had never seen it before – and it seems unlikely that this is as much the case as is sometimes supposed. We see resemblance when we already know the meaning" (70).

But while the visual language of photographic representation has to be learned, objects refer to our direct experience and therefore signify in a non-conventionalized manner. As indices, they designate through a "genuine relation" between themselves and their referents, which does not depend purely on "the interpreting mind" (as is the case with icons; Peirce, CP 2.92, 2.98). It is impossible to state with any certainty that the *paper* that physically constituted the photograph was outside of the Bush-woman's semiosphere – or rather, that she did not make sense of it by drawing on the knowledge available to her. She might have neither seen paper before nor knew how it is made, but – holding it in her hand – she was unable *not* to relate to it in some way, *not* to attach any meaning to it like she could have done with the tonal variations on its surface. The work in this project brings those discussions of the difference in perception of objects and images into the context of contemporary experience of photographs by putting viewers in a position analogous to that of the Bush-woman. While this is analysed in the fourth chapter, at this point it is important to stress that as material indices, photographs function as objects, not only as images.

Index as a trace of physical contact

I would like to propose a way of thinking about photographs as traces of physical contact - results of light reflected off the objects in front of a camera and falling onto a photosensitive surface. The first photographers used terms borrowed from printing and engraving to describe the medium - Talbot wrote of objects *impressing* or *delineating* their images. Two artworks where an object has been exposed to arbitrary external influences over a set period of time and subsequently displayed as a finished piece bearing marks of the process might help to illustrate the point. In Gabriel Orozco's *Yielding Stone* (1992) (figure 1.1) a ball of soft, grey plasticine is rolled through the streets gathering fragments and marks it encountered. In Francis Alys's *The Collector* (1991-2) (figure 1.2) a magnetized toy dog on wheels is dragged by the artist though the streets, picking up metallic detritus. Benjamin Buchloh has remarked that Orozco's piece is an example of "transforming a surface into a purely passive receptacle of merely accidental pictorial and indexical marks" (Buchloh, 17-18). In this respect, the plasticine ball and the magnetized dog are similar to a piece of photosensitive material: they are made to receive a record of a certain duration in time, to fix something as ethereal as a walk through a city in a tangible form.

Figure 1.1. Gabriel Orozco, *Yielding Stone*, 1992. Source: www.walkerart.com.

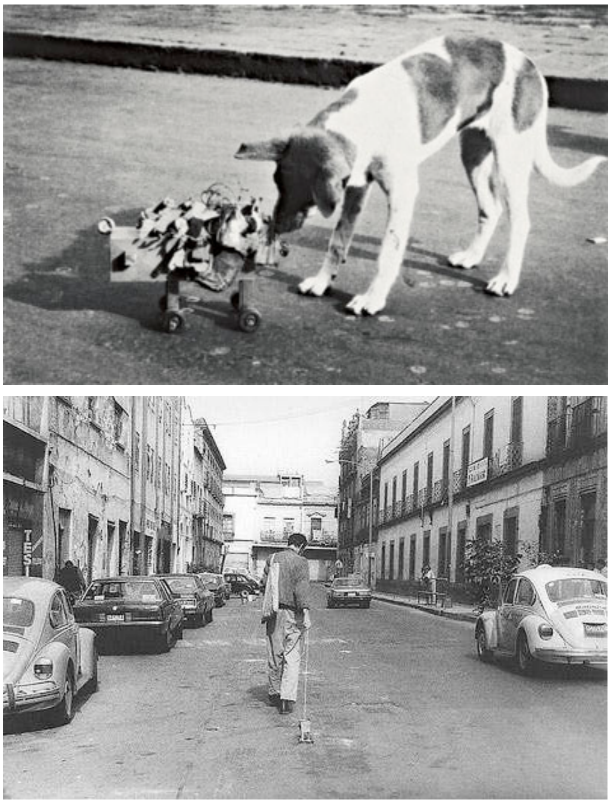

Figure 1.2. Francis Alys, *The Collector*, 1991-2. Source: www.oesquema.com.br.

The ability of an index to represent rests not only on its physical presence, but also on the strength of the convictions surrounding it (what I will in later chapters call a 'myth' that contributes to the perception of an object as auratic). Alys provides photographic documentation of the making of the work, thereby convincing viewers that the displayed object is indeed a trace of the particular event (and demonstrating very clearly the reliance of an index on the 'independent knowledge' of its production). Patrick Maynard has made a distinction between photographs' 'depictive' and 'manifestation' functions (1997), and argued that the latter "resembles an earlier and prolific, important sort of image, an icon: 'an image whose *function* is largely that of manifesting what it depicts and thereby providing realism through the sense of presence'" (1983, 165). The comparison of photographs with religious icons (especially with what is perhaps the icon par excellence – believed to have arisen through physical contact with the referent - the Shroud of Turin[4]) highlights the apparent paradoxes in the reception of indices. On one hand, it displays the desire to see in meaningless marks an image. What Georges Didi-Huberman termed 'the fantasy of referentiality' (1984), the desire to

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[4] Pope Francis and his predecessor Pope Benedict XVI have both described the Shroud of Turin as "an icon" ('Shroud of Turin', 2014).

see indexical marks as representing that which is familiar to us, causes the index to be overwhelmed by iconic and symbolic dimensions[5]. Therefore, as Mary Ann Doane notes, "the index is never enough – it stops short of meaning, presenting only its rubric or possibility, and for that reason is eminently exploitable" (12). On the other hand, however, there emerges the index's "resistance to iconicity that becomes, in the case of a photograph, according to Peirce, a mere accident or by-product of contact" (Doane, 6)[6]. As Didi-Huberman would have it, lack of iconicity strengthens the objectivity and authenticity of an indexical mode of production. Christopher Wood has even defined the index in a photograph as "the point where signification breaks down and the picture is connected to the moment that produced it" (24).

Without understanding photographs as outcomes of physical contact with the referent[7] their indexicality appears like a pointing finger - evacuated of content and designating something without describing it (as Peirce has it, "the index asserts nothing; it only says 'There!'" [W 5.162-3[8]]). But use of such deictic, context-dependent language to talk about photography usually results in mixing up indexicality with iconicity. For example David Green, quoting Barthes's assertion that "the photograph is never anything but an antiphon of 'Look', 'See', 'Here it is'" (1981, 5), writes: "thinking about the photograph's referentiality as analogous to deixis suggests that photographic meaning might lie not within the realm of representation but simply as a mode of designation" (246). The problem is that indices in this sense are essentially meaningless (Didi-Huberman: they don't "seem made to be understood" [65]), "they are limited to the assurance of existence; they provide no insight into the nature of their objects; they have no cognitive value" (Doane, 5). They are, from this point of view, like that photograph

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[5] A small, formless stain located on the Shroud of Turin in the place that would be Christ's right wrist is, according to Didi-Huberman, bestowed with the greatest authenticity precisely because of its lack of iconicity. "It arises from pure contingency", and "tells nothing in itself about its origin" (66), but its nonmimetic, noniconic nature guarantees its indexical value – "if there is no figuration it is because contact has taken place" (67-68).

[6] The case of the Shroud of Turin demonstrates this paradox. It displays 'almost nothing visible', and it that 'almost' there manifests the desire to see. But the fact that scientific methods have revealed no trace of blood on the Shroud constitutes no objection to authenticity – to the contrary, it strengthens it. Moreover, it can be said that the alternative declarations of fraudulence and authenticity of the Shroud of Turin have no influence on the indexicality of the stains themselves – they still evidence a historical event, even if one of fraud.

[7] Even when the physical contact is remarkably slight and indirect such as is the case with photographs printed from negatives or digitally.

[8] See: footnote 1.

in the hands of the Bush-woman who did not recognize an image. But as objects they can nonetheless carry meaning as manifestations of physical presence of their referent. In the next chapters I explore through my own practice this duality of photographs being on one hand dependent on the knowledge held by viewers about the way they came into being, while on the other, as objects, being able to signify independently of this knowledge.

Isolating photographic indexicality from iconicity

In as far as photography might be described as an indexical process utilized to produce iconic results, the Bush-woman story brings a rare clarity to the concepts of photographic indexicality and iconicity, which usually appear tangled to the degree of being inextricable. No agreement on the subject of photographic indexicality itself can be reached among academics specializing in the field, to which the roundtable discussion transcribed in *Photography Theory* testifies (Elkins 2007b, 130-203). The problem clearly stems from the fact that most photographs are both indices and icons (i.e. there is a causal connection between them and the objects they signify, and the significance takes place by resemblance). Jonathan Friday goes as far as saying that a photograph is not just a mix of an icon and an index but a *coincidence* of the two (Elkins 2007b, 135)[9]. The Bush-woman story illustrates the culturally-mediated, or ‘coded’, nature of photographic iconicity. Iconicity can be said to belong to the stage of reception of photographs, and therefore to be dependent on viewers. Indexicality, however, is the key principle at the stage of production. Photographs are indexical whether they are recognised as such or not - indeed, according to Peirce, a characteristic mark of indices is that “they have no significant resemblance to their objects” (CP 2.306), meaning that resemblance is “irrelevant to indexicality” (Brunet, 47). While a photograph might be unsuccessful in representing iconically due to, for example, unfamiliarity of viewers with the particular language of visual representation, a non-indexical photograph that was not caused by reflected light of some kind

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[9] In fact, Peirce never treated his categories of signs as rigid and exclusive, and they are better suited for describing strategies of signification than types of signs. He even noted that their status changed depending on which of his varying theories was applied. Therefore, the term ‘index’ as used in discussions around photography theory, and in this work, cognates loosely and does not strictly abide by the formative work on the concept by Peirce. Nonetheless, I attempt to bring some of Peirce’s observations on indexicality to the understanding of photography in a way that is not found in the writings on theory of photography.

(even if only reflected off air particles, or if ‘light’ is constituted by waves in the invisible part of the spectrum) falling onto a photosensitive surface is hard to conceive. It could therefore be argued that photographic indexicality has primacy over iconicity, since photographs are necessarily indexical through their nature, but only optionally iconic.

Another way to uncouple the seemingly indivisible pair of photographic icon and index is to consider photographs that fail to produce a discernible image of the referent. In the aforementioned roundtable discussion (Elkins 2007b) Joel Snyder proposes an example of a one-minute exposure during which the subject sneezes and his face appears in the photograph as a blur, arguing that the resulting smudge in the image is not an index of the subject. This is disputed (rightly, in my view) by other panellists, on the grounds that the subject is “indexically represented” (Friday, in Elkins 2007b, 134) whether or not the image looks like him. While Snyder confuses indexicality with iconicity, being convinced that it is necessary “to get to the index by way of the icon” (148), Friday to a lesser degree does the same in the unfortunate phrase that defines indexicality as a mode of representation clearly linked with producing a likeness[10]. As Margaret Iversen rightly notes, “[when] we are using indexicality to subtend iconicity, … we tend to get into trouble. The index doesn’t guarantee the resemblance of the image” (ibidem, 139). The work in this project seeks to contribute to the discussion from the position of practice rather than theory by proposing that photographic indexicality can exist independently of representation. As far as a photosensitive

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[10] Some critics believe that “it is the iconic character of the photograph that allows us to read it as an index” (Green, 246), not taking into account that indexicality itself is not objective or neutral, but it is mediated by the ‘independent knowledge’ that Peirce describes. To underline this, Lars Kiel Bertelsen proposed the term ‘ichnography’ to replace ‘indexicality’, reading it as “the science of describing (foot)prints” (from the Greek *ichnos* for ‘footprint’), or generally as “the art of writing with imprints as opposed to the art of writing with images” (iconicity) (170). Photographs have been often compared with footprints - Peirce himself mentions footprints as an example of an index (2.168). Susan Sontag famously wrote that a photograph is “a trace, something directly stencilled off the real, like a footprint or a death mask” (154). But the metaphor of footprints can be deceiving because it suggests to a certain degree a natural and intuitively understood phenomenon, while in fact footprints speak in a coded language that is both indexical and iconic. It is only possible to recognize an indent in the sand as a footprint if one has knowledge of both the laws of physics that cause an object to impress its shape in the sand and the kinds of things that have this particular shape. Analogically to Snyder’s blurred photograph example, if one encounters a smudge in the sand that was clearly caused by something exerting a pressure on the surface, but it is unclear what it was, then one possesses the knowledge ‘of the circumstances of production’ (one recognizes the index) but not the knowledge of the referent (the smudge does not signify iconically).

surface has been exposed in a camera, I consider the results to be photographs - that is, indices of the event of the exposure – irrespectively of whether an image is visible or not.

Indexicality, iconicity and the ‘transparent’ photographic surface

Despite the fact that the physical and causal process in which photographs arise necessarily implicates their materiality, the latter is often disregarded due to the overbearing insistence of iconic elements of images on being interpreted. A photograph appears to have no surface, and one automatically looks through it to see what it is of. Krauss has called this reaction the ‘it’s’ response: ‘it’s a portrait’, ‘it’s a landscape’ (1984). Paradoxically, this ‘transparency’ of the photographic surface can lead to acknowledging the materiality of the referent, but only on account of the iconicity of photographs and its highly coded character, rather than on account of their indexicality. As Kenneth Calhoon has argued, when an image is perceived to ‘stand in’ for the materiality of its referent, it displays some of the properties of the fetish. Because of its ability to project “beyond what it permits us to see”, to “*insignify* itself” (616-617), it has the structure of the fetish: the assurance that “*the thing has been there*” (keyed to the materiality of the referent) is opposed to the knowledge that it is there no longer (provided by the materiality of the photograph). Barthes links the ‘transparency’ of photographs to their ability to evoke sensuous, tactile responses, “to restore an intimacy that lies beyond and before sight” (Calhoon, 617). In Kertesz’s photograph of a blind gypsy, he perceives the texture of the road by means of corporeal knowledge (“I recognize, with my whole body”) rather than purely by sight. “The photograph that ‘touches’ the spectator activates a mode of perception that is simultaneously self-perception” (Calhoon, 617), and so Barthes “insinuates himself into the scene in the place of the blind man, oblivious to the obstacle that matter poses to pure representation” (Calhoon, 618).

But what Barthes sees is the texture of the road rather than the texture of the paper the photograph is printed on. Objecting to this tendency to look through the surface of a photograph, Elkins argues that “if he cared to look, he would have seen the sharp-edged dust and scratches on his old studio prints, or the smeared Bende dots and scruffy paper fibres of his newspaper and magazine photos” (2011, 37). Unlike Barthes, Elkins attends to the indexical character of the photographic surface - “the layers of dyes, silver halide molecules, the paper base and the water-resistant surface" as an illegible arrangement of marks and scratches, that constitutes "not just a part of photography, but most of it, sometimes all of it" (2007, 29). He suggests a radically different, 'non-semiotic'[11] understanding of photographic marks as incomprehensible rather than in need of being assigned meaning or as 'merely technical' (1995, 2011). My practice develops this concept further – the materiality of photographs is seen here right from the stage of production as arising from the process of their making rather than from the effect of 'transparent' photographic surface.

When Barthes sees a photograph as identical with its referent ("to annihilate itself as a medium, to be no longer a sign but the thing itself" 1981, 49), he seems to follow in the footsteps of Andre Bazin, who described

> the photographic image [as] the object itself, the object freed from the conditions of time and space that govern it. No matter how fuzzy, distorted, or discoloured, no matter how lacking in documentary value an image may be, it shares, by virtue of the very process of its becoming, the being of the model of which it is the representation; it *is* the model. … The photograph as such and the object itself share a common being. (1960)

But in fact this passage suggests something very different than Barthes's. Although at first glance Bazin appears to uncritically 'give in' to the illusion of representation, in fact he points to the purely indexical character of the photographic image-as-object ("the process of becoming") that is independent of its iconicity ("no matter how fuzzy …"). Equating the physical form of a photograph with its referent, while still far fetched, in this context strikes me as a pertinent remark on the interdependence of materiality and indexicality, with iconicity being a usual but not essential element of the equation.

This perception of the material of a photograph standing in for its referent irrespectively of its representational value has been explored by artists. For example, Gordon Matta-Clark treated photographic prints specifically as a physical medium. In 1969, he brought into the gallery a stove and began cooking photographs in a pan of grease[12]. Later, he sent to his friends "small boxes with fried, barely legible Polaroids with a Christmas tree, blistered and coruscated rectangles delicately flecked with annealed bits of gold leaf – the residue of

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[11] The term 'non-semiotic' is used by Elkins in the sense of not being culturally coded, therefore not belonging to the Saussure's system of signs. In Peirce's semiotics, such signs are indices. Peirce considered lack of semiosis to be an impossibility.

[12] "'After he finished his *Photo-Fry*, he just left it there' the gallerist John Gibson recalls. 'I stayed open all summer with that in place and the awful smell'" (in Jacob, 23).

metallic sheets thrown into the pan at the same time” (in Westgeest, 41). The critic Thomas Crow finds in this gesture “a chain of reduction from the rural origin of the conifer, to the photograph, to the charred chemical-cellulose amalgam” (ibidem), whereby first a photograph substitutes itself for the object it represents, and then another object substitutes itself for the photograph. But such analysis is in my view misleading – it exemplifies the tendency to make a distinction, in terms of its physical presence, between a photograph that represents pictorially and (the same) one that does not (if not to altogether overlook the physicality of a photograph until its pictorial qualities diminish). The fried photograph is accompanied in its box by a text ‘A gold leafed photo-fried Xmas tree (…)’ (figure 1.3), which suggests that the frying treatment was conceived as being applied, metaphorically at least, directly to the object in the photograph rather than the image-as-object. The inscription, moreover, implies that what emerged is not yet another object substituted for the photograph, but still the initial – albeit transformed – object, i.e. the Christmas tree. A photograph is an object from its conception irrespectively of its pictorial qualities or any treatments applied to it. However, I agree with Crow that the result of Matta-Clark’s actions “confounds the terms of vision and experience in a strangely novel fashion” (ibidem, 55).

Figure 1.3. Gordon Matta-Clark, *Photo-Fry*, 1969. Source: www.mutualart.com.

Similarly, theoreticians analysing photographs as physical objects within the area of material culture studies have noted the importance of photographs' "materiality and thingness" rather than their "textuality and content" (Edwards 2009b, 136). For example, Elisabeth Edwards studies photographs from a position of an anthropologist, with an interest in the social and cultural context in which they commonly function. In analysing photographs as objects, however, there is a danger of perceiving the materiality as independent of their intrinsic indexicality – it is linked with their function, for example as family portraits, not with their mode of becoming as necessarily material objects exposed to the light reflected off their referent. Although photographs fundamentally exist as physical objects in time and space, collecting marks of passage through the world, this in itself does not differentiate them from other objects (as Edwards herself admits [2001, 16]). Vernacular photographs are "handled, caressed, stroked, kissed, torn, wept over, …" (Edwards 2009a, 33)[13], but then so are other items that trigger an emotional response. As Elkins shows (2011, 44), this response to the materiality of photographs on account of their iconic value and the 'transparent' surface effect that allow them to 'stand in' for the referent is distracting when analysing the aspects of materiality that are necessitated by their indexical character, and that are therefore uniquely photographic. As I explain in the next chapter, my choice of subject matter is partly guided by an intention to avoid such a response in order to be able to examine the way photographs function as material indices.

Indexicality and photographic reproducibility

A distinction needs to be made at this point between the indexicality of unique photographic objects and of reproductions. Although physicality of photographs is acknowledged by anthropologists such as Edwards, and the non-semiotic understanding of marks that Elkins proposes rightly recognizes materiality of photographs as arising from the mode of their production, it is the production of copies (darkroom prints, newspaper reproductions) rather than the photographic event of light reflected off the referent touching the photosensitive surface inside the camera that the physical marks are indexical of. The fact that physical forms of

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[13] The title of my thesis is an unintended but perhaps fitting reference to this essay entitled 'Thinking photography beyond the visual?'. It implies a practitioner's perspective that varies markedly, as the next chapters will show, from that of a theoretician.

photographs as we know and use them originate in post-processing and are therefore incidental to the time and place they depict appears to account not only for their being habitually overlooked in favour of what the photographs represent, but also for the analysis of materiality as separate from the image. Consequently, calls for breaking "the dominance of image content and look[ing] at the physical attributes of the photograph that influence content in the arrangement and projection of visual information" (Edwards and Hart, 2) face not only the inherent reproducibility and therefore essential immateriality of the image, but are greatly weakened by the fact that the material forms of those images are arbitrary to their content.

Because the reading of a photograph can change dramatically depending on the physical support and its context, it is perhaps little wonder that the indexical relationship of a photograph to its referent is not commonly extended to its material form when photographs resulting from the usual reproduction processes are concerned (negative-positive, mechanical reproduction etc.). Only in the case of unique objects produced in-camera - direct positives, negatives considered as finished products, Polaroids, etc. – is the physical form of an image of the same order that indexical photographic marks caused by the action of light (both having originated in the event of the photograph's making), therefore positioning materiality as not separate from photographic image but intrinsic to it. In this respect, Matta-Clark's use of Polaroids rather than darkroom prints seems to me crucial in establishing the link between the photographed object and the physicality of the photograph that his work explores[14]. The classic example is that of daguerreotypes, which are not only unique images but also objects with an aura of something fragile and precious. Because the surface of silvered copper plates was delicate and easily scratched, it was protected, usually with a leather case covered in velvet. It also acted like a mirror, making the image properly visible only at a certain angle. Clarke notes that a daguerreotype "became as much an object of attention, as it was an image of information, thus declaring, from the beginning, the photograph's dual nature as both object and image" (15).

My artistic practice attempts to shed light on the issue of indexicality of unique photographic objects and of reproductions by proposing a view of photography not

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[14] Again, I have to disagree with Thomas Crow, who disregards the physical dimension of a Polaroid print and its direct connection to the referent when he writes about "rendering the representations embedded in lowly Polaroid prints into sculptural objects" (in Westgeest, 55).

only as an image-making but equally as an object-making endeavour. As outcomes of a causal (indexical) process, photographs necessarily carry a relation to their referent through their materials. Screening a sheet of paper and building a camera are in my view not foreign to the nature of photography but rather inseparable from the causal relation between the subject and the work (they are itself photographic in the broader understanding of the medium that my practice develops)[15]. They belong to a process where intentionality sets causality in motion. This is contrary to some conservative views whereby intentionality is seen in strict opposition to the inherent automaticity of the medium[16]. But as Diarmuid Costello has noted, the two categories are not exclusive - “treating ‘automatism’ and ‘agency’ in general as zero-sum opposition is incoherent” (2009, 15). Insofar as “’automatism’ depends on mechanical purposive design, it is not independent of human agency” (Costello 2009, 16)[17].

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[15] Making paper or building cameras may appear as distinct stages of the process, but a photographic exposure is not possible without either. To consider them as separate media of representation appears to me to be a logical fallacy resulting from a perception of photography as detached from the necessary materiality of its products. Because my intention is to produce a photograph of a place with as little tools and materials brought to the site as possible, and instead create conditions for the representation to arise using what is available to me there, I consider the whole process, including making the paper and the camera, as photographic in the sense of its aim being to produce a photograph.

[16] For example, the philosopher Roger Scruton refutes the possibility of a photograph to truly *re*present on account of its automaticity. He understands intentionality in strict opposition to causality, which “can only hinder representation” (160) because it does not generate what he calls an ‘aesthetic interest’ (that is, an interest not only in *what* but primarily in *how* something is represented). Photography, in his view, does not allow for direct involvement of an artist with materials that he considers to be a marker of intentionality of an art form.

[17] Neither are other media such as painting free of causality - causal processes appear in manual arts “in virtue of their physical substances” (Costello 2009, 16). Producing objects (be it paintings or photographs) always involves causality (objects are always indices of the process of their becoming). Moreover, it seems that whenever artworks as material entities are concerned (that is, excluding literature, music, or conceptual art), the aesthetic interest in representation itself relates as much to the causal processes involved in the production of the piece as it does to the intentions of the artist – or rather, the two are never far apart. The *how* of applying paint to canvas, carving a sculpture or producing a photographic print is as central to aesthetic interest as the *why*. As in the case of producing my work, causality is directed by intentionality – merely the degree of physical contact between the artist and the piece varies between art forms.

Iconicity and the coded visual language

As Friday rightly remarks, “the index is relatively straightforward. It is the icon that is extremely complex” (in Elkins 2007b, 138). This is because iconicity leads straight to ‘reading’ a picture and ascribing it meaning in a process far more culturally coded than the application of the ‘independent knowledge’ necessary to recognize an index. As the Bush-woman anecdote demonstrated, this ability to ‘read’ photographic images is dependent on cultural context, not unlike the ability to read written language. Photographic iconicity triggers an instantaneous process that takes place largely involuntarily and unconsciously, similarly to what the philosopher David Abram calls the “apparently autonomous, mental dimension opened by alphabet – the ability to interact with our own signs in utter abstraction from our earthly surroundings” (1997, 265). At the same time, as objects, images appear to be actual “physical fragments, visitants, from the world”, in Wood’s words (24), and therefore to be in lesser need of contextualisation than linguistic signs. As a result, “a specific photograph … is never distinguished from its referent, or at least it is not immediately or generally distinguished from its referent” (Barthes 1981, 5). Media theorist Paul Frosh writes that “cultural codes of meaning are, in a sense, an imposition and an unavoidable supplement” (71), in Derridean understanding of being both surplus to pure indexicality and taking its place, “hence the most prominent cultural connotation of the photograph is that it is purely indexical” (88), which it clearly is not.

In the past decades it has been largely the emergence of digital processes and electronic manipulations that caused public doubts about photographic truth (the instantaneous ‘reading’ of picture without being aware of the coded nature of its visual language). However, the first photographers were very conscious of the paradox of photography being visually both true and not true to its referent. Talbot reminds his readers in *The Pencil of Nature* that the included photogram of lace is a negative, showing the subject as white while in fact it was black. He therefore points to photography’s indexicality guaranteeing an accurate impression of the pattern but not necessarily reproducing its true appearance (Batchen 2008, 13). If one adds to this single point perspective, planes of focus, depth of field etc. it becomes clear that the way photography records the world differs markedly from human vision[18]. The medium seems to function like Plato’s ‘semblance’

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[18] As Christopher Townsend writes, single point perspective appears natural, “a necessary way of depicting the world”, but it is in fact “one more historically variable,

(*phantasms*) as distinguished from ‘likeness’ (*eikons*) (in *Sophist* 236 a-d). While likeness conforms to the original’s proportions in all three dimensions, semblance is like a colossal sculpture that has its proportions altered to accommodate the perspective of its viewers so that the upper parts do not look too small and the lower parts too large. Whereas the icon is ‘other but like’, the phantasm appears to look like the thing it represents because of the place from which it is viewed. The same can be said about photographs, not only in the physical sense but also in the sense of the potential of a photograph to elicit multiple meanings according to the cultural codes employed by its viewers[19].

Many artists have intentionally disturbed the perception of photographs as what Kendal Walton called ‘transparent pictures’ (1984), either through manipulating its physical dimension, or through combining photographs with other objects. For example, different ways of presenting the same image by the Swiss/Dutch artist Batia Suter demonstrate how the illusion of photographic depth is disturbed by surface manipulation. When the photograph of a huge hole in a wall (*Untitled*, 2001, figure 1.4) covers the whole wall of an exhibition space it creates a convincing optical effect of *trompe l’oeil* (broken only by the doors in the wall). When the same image is printed on a curtain covering a wall (*Untitled*, 2004, figure 1.5) the rippled surface competes with the illusion of the view behind the curtain, creating an awareness of the image plane and its presence in the room[20].

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ideologically determined form of vision” (69). In comparison, photograms, such as Talbot’s lace imprints, “imputed a kind of agency to the object in its own depiction that was undermined by the introduction of a system of perspective that organised the seeing of the object” (ibidem).

[19] Peirce’s category of iconic signs included “every diagram, even although there be no sensuous resemblance between it and its object, but only an analogy between the relations of the parts of each” (CP 2.279). “Many diagrams resemble their objects not at all in looks; it is only in respect to the relations of their parts that their likeness consists” (Peirce, CP 2.282). Similarly, “pictures resemble what they represent only in some respects. What we tend to recognize in an image are analogous relations of parts to a whole” (Chandler, 40).

[20] I do not agree with Helen Westgeest that “the two deal [merely] with two different forms of transparency” and that “we are not attracted by [the] surface” (13) – the rippled surface is what makes the viewer stop and look twice, creating an awareness of the image plane – imperfect, because not flat – that competes with the illusion of representation.

Figure 1.4. Batia Suter, *Untitled*, 2001. Sketch for an exhibition in Helmhaus, Zürich, Switzerland. Source: batiasuter.org.

Figure 1.5. Batia Suter, *Untitled*, 2004. 250x550cm, Hans-Trudel-Haus, Baden, Switzerland. Source: batiasuter.org.

The complexity of observation and identification of photography is fully experienced when photographs are integrated in spatial assemblages such as *Two Clans, Two Families* (1997-98) by Annette Messager (figure 1.6). On one hand, the referent of a photograph that is combined with physical objects such as a stuffed toy and a cross stand acquires an immediate presence in viewers' space. Messager intentionally exploits the tendency to substitute the physicality of a photograph for that of the referent ("I like playing with real, human 'material'", she says [in Westgeest, 114]). On the other hand, the faces are still experienced as photographs, due to their flatness that stands out against the three-dimensionality of the toys. Moreover, within the area of each of the photographs themselves, a similar oscillation between seeing the referent and the piece of photographic paper[21] occurs on account of half of the edge (and half of the represented face) being obscured by the toy. Where the edge is not visible, the photographic reality blends seamlessly with the reality of the assemblage. In other places, where the edge cuts across the subject, it creates an impression of looking through a window onto another reality, where the subject is complete[22].

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[21] Helen Westgeest compares this experience of seeing alternately the referent and the piece of paper to the famous Ludwig Wittgenstein's 'duck-rabbit' experiment.

[22] The characteristic brushwork border of manually sensitized photographs has a similar effect of bridging the gap between the reality of the image and that of the viewer. It betrays the gestures of the hand performing the coating and does not allow the viewer to forget they are looking at a material object bearing an imperfect representation of the world rather than a fragment of the world itself. To use the distinction Tim Ingold makes (2007, 84-85), they are like sketch maps, direct evolutions of a gesture, making no claim to represent with any accuracy. Elkins notes that all manually sensitized photographs "were, in effect, paintings, before they were photographs" (2011, 26),

Figure 1.6. Annette Messager, *Two Clans, Two Families*, 1997-98, details.

However, as soon as one follows Elkins's advice (2005, 2011) to move away from the vernacular image-making (tied to the exigencies of human scale, preferring the poetic, the subjective, the nostalgic, the candid) when thinking about photographs, one finds that pictures do not always conform to the conventions of reading them. Unlike the images in Suter's and Messager's works, they resist being interpreted as meaningful signs, and instead point to their mechanical origins. What was historically so shocking about photography, after all, was not that it looked like the world of ordinary perception but rather that it did *not*. Walter Benjamin has written that

> it is another nature that speaks to the camera than to the eye. (…) Details of structure, cellular tissue, with which technology and medicine are normally concerned – all this is in its origins more native to the camera than the atmospheric landscape or the soulful portrait (1979, 243).

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carrying marks of their own making. Sharp edges of photographic images, on the other hand, like those of cartographic maps, detach them from the world in which they exist as material objects and allow them to function as windows to another reality. A hand-sensitized photograph with soft borders appears to have the potential to continue beyond the sheet of paper that supports it and enter the world of the viewer. Although associated with early photographic processes, he brushed edges can actually be seen in only a handful of 19th century photographs because it was customary to cut the margins away. Nowadays, they are a mark of historic photographic techniques requiring manual application of chemicals to a surface – for example a sheet of paper. As such, they are largely aestheticized and almost always left intact to be displayed and therefore to act as an immediate sign of the print being executed in one of the alternative photographic processes.

Numerous applications of photography from the worlds of science and technology can be given as examples to illustrate this point[23]. They act as a reminder, firstly, that photographs are direct imprints of that which remains invisible to the human eye (light) unless it is reflected off a physical object (which, however, does not act on a photosensitive surface directly); and secondly, that light modifies the halides of the photosensitive layer in a random way (as the philosopher Henri Van Lier argues, “the vagaries and grains are as fundamental to nature as figural rigidity” [60]). In this sense, even among indices, photographs are perhaps particularly removed from their referents and therefore from meaningfully signifying them from what Elkins calls the ‘human perspective’. Photographs that do not carry a clearly recognizable likeness of their subject resist our automatic reaction to look *through* them and to ‘read’ them. It is such photographs not conforming to the human perspective that most successfully expose the culturally coded language of images and at the same time bring to the fore their physical dimension. As Elkins asserts,

> When a photograph has no face in it, no immediate comfort for my eye, no instant pleasure in the seeing, then a strange kind of recognition begins to come into its own: not the troubled or happy discovery of another life (…), but a reminder of something outside personal and common memory (2011, 50).

This, in turn, to paraphrase David Abram, can direct viewers towards a kind of perception that precedes and underlies visual literacy, and that “strives to be faithful (…) to the sensuous world itself” (1997, 265).

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[23] Elkins gives numerous examples in his writings (2005, 2011). For instance, some electron microscope technologies do away with lenses, and rather than recording reflected light, they produce images of differences in currents, or even of probability functions, which nonetheless still appear to our eyes to be pictures of solid objects (2005). But it is not only when the subject is far removed from the human scale, as Benjamin’s quote might suggest, that photographs are found to defy the conventions of reading them. Snyder and Allen give an interesting example of a photofinish camera, which is used to produce a record of the finish of a horserace (1975, 157-9). It is a slit camera with a film moving continuously past the open shutter, recording the single image of the finish line. As the horses move past (roughly at the speed corresponding to the speed of the moving film), their bodies are recorded and the image shows the exact order of finish of all the horses in the race. The picture looks realistic enough to conventionally interpret it as a photograph of horses that were in different places at the same time, while in fact it shows the horses in the same place at different times. To look from right to left across the picture is to move through time rather than space. In those examples the photograph’s value as an index is almost completely severed from the creation of visual likeness, and the knowledge of the process is necessary to be able to interpret what it shows.

Chapter conclusion

As indices in the strict semiotic sense of the term, photographs primarily manifest themselves in their materiality as physical traces, and it is only by way of cultural conventions that they function as visual likenesses. The perception of photographs as ‘transparent pictures’ that accurately represent their referent relies on cultural codes, even though, due to the mechanical character of the medium, it appears entirely natural (hence Barthes’s description of a photograph as a ‘message without a code’). Moreover, a familiarity with, and a homogenous understanding of, this coded language cannot be assumed. A photograph cannot therefore be defined through the quality of pictorial representation. On the other hand, a non-indexical photograph that was not caused by reflected light of some kind (even if only reflected off air particles, or if ‘light’ is constituted by waves in the invisible part of the spectrum) falling onto a photosensitive surface is hard to conceive. As imprints of light reflected off the objects in front of a lens photographs can be said to undoubtedly signify, but only the process of their making (i.e. their photographic nature), not necessarily their subjects. Even for this act of meaning-making to be successful, viewers must have what Peirce called ‘an independent knowledge of the circumstances of production’. The only element that is immediately and unequivocally recognized is their physicality as objects. As will become clear in the next chapters, by investigating the processes of making and reception of photographs that do not clearly depict their referent, my own work contributes to the understanding of the dependence of all photographs on the common knowledge held about the medium to be identified as such.

“The tactile qualities of photographs, with their smooth surfaces and delicate paper bases, may be secondary to the visual” (Edwards 2009a, 44) in case of reproduced photographs (since the reproduction processes are designed to replicate the image, not its physical form). But they are absolutely essential to the photographic objects produced in-camera by being intrinsically linked to the indexical mode of their making. The latter may be extreme examples that nevertheless shed light on what pertains to all photographs. In fact, the issues discussed in this chapter, such as the similarities between photographs and icons, their ‘manifestation’ function or the mechanical, non-human aspects of the medium apply, strictly speaking, only to photographs as the objects exposed directly in-camera, not their reproductions or prints. I agree with Edwards that “the experience of photographs, their meaning and impact, cannot be reduced merely to a visual response” (ibidem, 45), although for the reason that photographs come into being as physical objects, not because of the possibility of sensory engagement with what is usually one of their multiple materializations. Analysing materiality only in the context of viewing and handling photographs rather than in the context of their ontology puts results before the process of creation. Both indexicality and materiality have to be untangled from their usual place in discussions on how photographs signify (both through their representational, iconic qualities and their physical presence) to begin to analyse their role in the nature of the photographic object. The next chapter builds on this discussion and takes it further by demonstrating how this understanding of photographs has shaped the making of the work in this project.

Chapter II. Making photographs as material indices

This chapter shows how the artistic practice at the heart of this research project has arisen from the theoretical concerns introduced in the previous chapter. It begins by tracing the activity of developing photographic processes, camera building methods and papermaking techniques suitable, in my view, for investigating photographic indexicality. This has been informed by a survey of publications (both those covering the history of the two disciplines, and practical manuals), site-specific research (visits to traditional papermills), workshops with experts in the field, as well as practical tests conducted in the darkroom, in Paper Studio Northumbria[24] and in the field. Artist residencies allowed me to spend extended periods of time interacting with remote alpine environments and making the works, thus greatly influencing the evolution of ideas fundamental to the project. Film material showing the making of every photograph emerged as a critical tool for exploring further the differences between perception of images and objects, and, more importantly, for analyzing the process of meaning-making in response to conventional signs such as a filmic image. The latter, despite signifying iconically, indicates the nature of the objects in a manner that requires an act of inference, mirroring therefore the indexical character of the objects to the sites. Finally, exhibiting the work in a variety of contexts and installation formats, showing it in public talks, as well as informally to fellow artists has been invaluable in assessing how the research is received and understood, and in refining the conditions of its reception.

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[24] Paper Studio Northumbria is a unique facility for the research, teaching and scholarship of paper in relation to fine art, conservation and archiving, as well as into the practice of papermaking. This project has developed in tandem with the Studio, supervised by Siân Bowen, the Studio director. It has been devised in response to the call for proposals, announced by Northumbria University, for projects that would investigate the relevance of paper as a contemporary fine art medium in the increasingly 'screen' oriented world of the 21st century.

My concept of photography - about my practice

The wider context of this project is established by the specific concept of photography that I have developed through my artistic practice, and that has lead me to an interest in indexicality demonstrated in the previous chapter. I am driven by an idea that might seem very obvious, yet its full implications are perhaps rarely taken into account. When I am photographing, I have a mental picture of rays of light reflected off the subject in front of the camera, passing through the lens, falling onto the photosensitive material and imprinting an image. Despite being established ‘merely’ by invisible photons having touched both the subject and the photographic material, the connection between the two is for me an absolutely physical one, and exists independently of whether any image is eventually legible as what might be called a ‘photograph’ or not. The focus is always on the process of making and on the moment of exposure, and the resulting object functions as an artefact that testifies through its presence - rather than through similarity to anything that a photograph might signify outside of itself – to the exposure having taken place.

My interests have been revolving around ways that photographs can signify other than purely as images independent of their support (where the surface is perceived as ‘transparent’ in the sense that we look ‘through’ it to see the picture), and how experimenting with the processes of image-formation might expand the limits of what photographs can represent. In *The Walking Project* (2008-2010) I used photography in an attempt to communicate the subjective experience of long-distance walking – that is, of the world understood in spatiotemporal terms and in relation to the body as the necessary subject of perception. Convinced that the experience cannot be satisfactorily represented by capturing in an image a single moment out of its duration, I embarked on technical experiments with cameras and photographic materials to be able to record a walk in its continuity. A multitude of approaches, including long-exposure photographs (done, for example, by slowly winding a 15m-long roll of film through a pinhole camera with an open shutter while walking, figure 2.1), analogue and digital films, heart-rate records, sound records, maps, etc., all aimed at the impossible: materialization of a transient experience of basic activity engaging the body in a linear progress through space and time, and production of an object indexical to the distance and duration of the experience (figures 2.1, 2.2).

Figure 2.1. *Walking in Pfalzerwald, 30 Oct – 4 Nov 2008.* 15m roll of 35mm photographic film exposed continuously while walking and advancing the film in a pinhole camera. Part of *The Walking Project*. Work by the author.

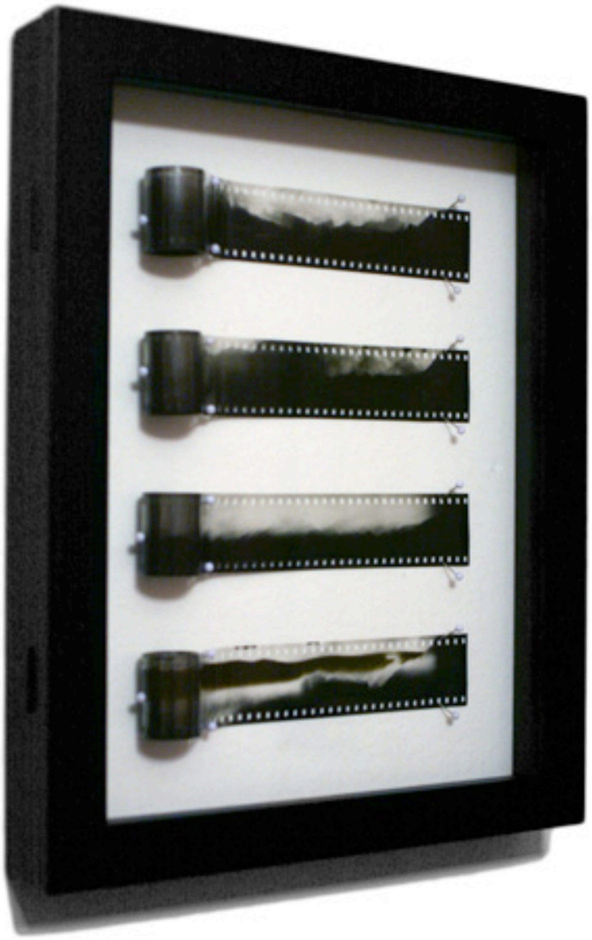

Figure 2.2. *Rund den Berg der Berge. 4 days walking along 4 valleys around Matterhorn, Switzerland. 3, 4, 7, 8 Aug 2010.* Overlapping exposures on 35mm film taken every 100 steps while walking, with film advanced 0.5cm in-between, one roll of film per day, framed, 28x35cm. Part of *The Walking Project*. Work by the author.

There is a continuity between those previous works and the current project - they share a concern with attempting to represent that which I feel cannot be adequately communicated through conventional photographic techniques – and most likely cannot be adequately communicated at all (whether it is a durational experience of walking, or embodied perception of remote locations). Although this view brings to mind works of artists such as Richard Long or Hamish Fulton, my use of photography differs markedly from theirs; both these artists have expressed the inability of photography to satisfactorily represent the experience of walking[25]

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[25] I have used Hamish Fulton's expression of this inability as a challenge and a starting point for my work in *The Walking Project* (2008-2010). He has said: "the idea that one photograph can document the duration of a walk is clearly ridiculous: an object cannot compete with an experience" (in Tufnell & Wilson 2002, 27). Richard Long's use of photography in the 1960s as a way to document a temporary and site-specific performative action in a landscape also suggests that he considered photographs to

and have, since their earlier photographic works, used other media such as sculpture or text[26]. I believe, however, that such representation can be attempted photographically - albeit by treating photographs as physical traces of the time and place of their making rather than as purely visual entities. The moment of photographic exposure, when a link is formed between the photosensitive surface and the physical world, is pivotal both to my own activity of, for example, building photographic apparatus or making photosensitive materials, and to viewers' apprehension of the resulting object as an actual trace (rather than an image) of the referent.

Direct positive photographic process

This research is motivated by a desire to produce finished photographs in-camera, whereby a photograph is not only an image but also a physical entity – crucially, the exact one that has received and recorded the light reflected off objects positioned in front of the lens at the time of exposure. The sense of wonder at a photograph as a conduit for the presence of the referent to be made available to its viewers lies at the heart of photography and photographic indexicality. It was perhaps most vividly described by Roland Barthes: “The photograph is literally the emanation of the referent. From a real body, which was there, proceed radiations which ultimately touch me, who am here” (1981, 80). Quoting Susan Sontag, Barthes compares the light emitted by the ‘missing being’ in the photograph to the “delayed rays of a star” (1981, 80-81). This account omits, however, the fact that the physical link between the referent and the photographic print (whether darkroom, offset, or digital) produced after the time of making the exposure is remarkably slight. Direct positive processes were therefore chosen at the onset of the project as a way of preserving the material connection between the photographic object and its referent that is forged at the time and place of exposure.

The subsequent search for a functioning direct positive photographic process has taken me back to the way of thinking about photography and working in the medium that would perhaps seem familiar to the first photographers – a trial-and-error process of experimenting with substances that focused on the material

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merely point to the event having taken place, rather than to communicate the fullness of the experience to the viewer.

[26] Hamish Fulton in particular has largely switched from photographic works to purely textual pieces.

aspects of producing an image rather than its role as a carrier of information. Instructions from many different sources (historical and modern) were studied, and a large variety of direct positive processes were tested at the start of the project (appendices 1 and 2; figure 2.3). The procedure of reviving these processes and finding one that could be adapted to working on-site (figures 2.4, 2.5) lasted many months and was particularly cumbersome, as scarcely any instructions for obtaining direct positive images can be found, and the few 19th century ones read to a contemporary practitioner like alchemical texts. The success in the 1840s of Talbot's calotype negative-positive process[27], useful for obtaining multiple copies of a photograph, meant that producing direct positive pictures in a camera (something that daguerreotypes were doing on a silver plate before the widespread use of paper in photography) was no longer desirable after mid-19th century, and those processes were quickly forgotten. Working with historical photographic processes allowed me to become immersed in the world of materials and the entire physical process of forming an image that remains largely hidden and out of reach in the more advanced photographic techniques (films are in canisters, digital sensors are housed deep inside camera bodies). The focus is firmly on the process of making a photograph (or, to use the way of thinking of the first photographers, on creating conditions for an image to arise), rather than on what it is a photograph of[28].

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[27] Calotype was introduced in 1838 by Henry Fox Talbot and uses paper coated with silver iodide. It produces a negative image from which multiple positives could be made by contact printing. This was its main advantage over the - initially more popular - daguerreotype, which produces a unique positive image on a metal plate and cannot be easily reproduced. Calotype was later replaced by the collodion process and eventually by celluloid photographic negatives, all of which are what I will further refer to as negative-positive processes.

[28] This focus on the process of making is shared with the first photographers, who were primarily concerned with devising a method of fixing the image that formed inside a camera, and only secondarily with the possible applications of the new medium. The significance of the subject matter they placed in front of their lenses was limited to providing a good contrast between lights and shadows, and being located in close proximity to their laboratories. Views from a window were a popular choice – early works of Henry Fox Talbot or Nicephore Niepce are a good example.

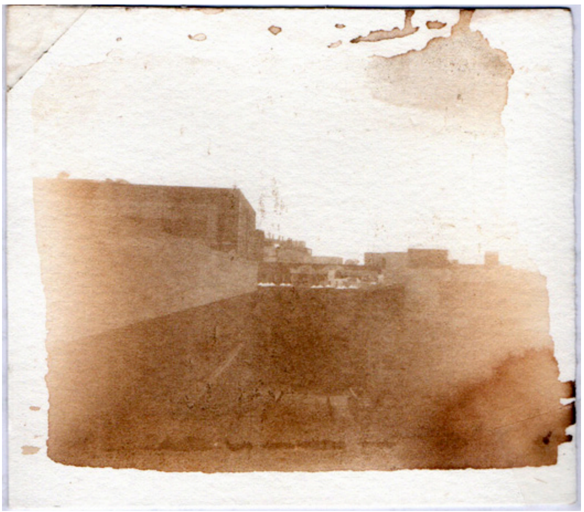

Figure 2.3. An example of an early test of a leucotype (Talbot's direct positive calotype) process from 1840s carried out in Northumbria University photographic darkroom, 12.5.11. Work by the author.

Figure 2.4. Direct positive leucotype, image exposed in an A3-size self-constructed box camera (see: figure 2.5) on Fuorcla Champatsch, overlooking Piz Davo Lais, in the Swiss Alps, 3 Jul 2011. Work by the author.

Figure 2.5. Image documenting the photograph in figure 2.4 being exposed, with the box camera visible in the lower left corner, facing away and to the right. 3.7.2011. Work by the author.

Building cameras, including ‘hole in the ground’ cameras

Constructing primitive cameras, including what I called ‘hole in the ground’ cameras, is a consequence of the desire for a greater immediacy between the place of making the exposure and the photographic material that accounts for the use of direct positive processes. At first, self-constructed cameras with simple lenses able to expose papers up to A3 format were used (figure 2.5), but the physical presence of the camera felt like a barrier sealing off the paper being exposed from the environment being photographed. The idea of bringing the material out of the camera and in contact with the subject was developed during an artist residency in Nairs, Scuol, Switzerland, between May and July 2011. It evolved, initially from laying the sensitized paper directly on the ground, tightly covered with a bottomless box serving as a camera (figures 2.6-7); through to separating the inside skeletal construction of a camera (figure 2.8) from the outside lightproof cover that would allow easy access to the paper inside for processing (figure 2.9); and eventually led to constructing a camera on-site, from whatever material is available. After all, if the paper is to be in contact with the photographed environment, there is no need to bring a camera along – it is enough to find or create a dark chamber (literally ‘camera obscura’) suitable for making an exposure: finding a small cave, digging a hole in the ground etc. The latter is the easiest to execute in most types of terrain and involves a horizontally positioned paper lying at the bottom of the hole and a lens fitted with a mirror at a 45° angle over it that reflects the image and projects it downwards (figures 2.10-11). Later (2013), to enable better control of the focal length while exposing materials that required the maximum amount of light to enter the camera (and hence no aperture, resulting in a very shallow depth of field), a method of erecting a box construction from brought materials and stabilising it with rocks found on-site was used (figures 2.12, 3.2).

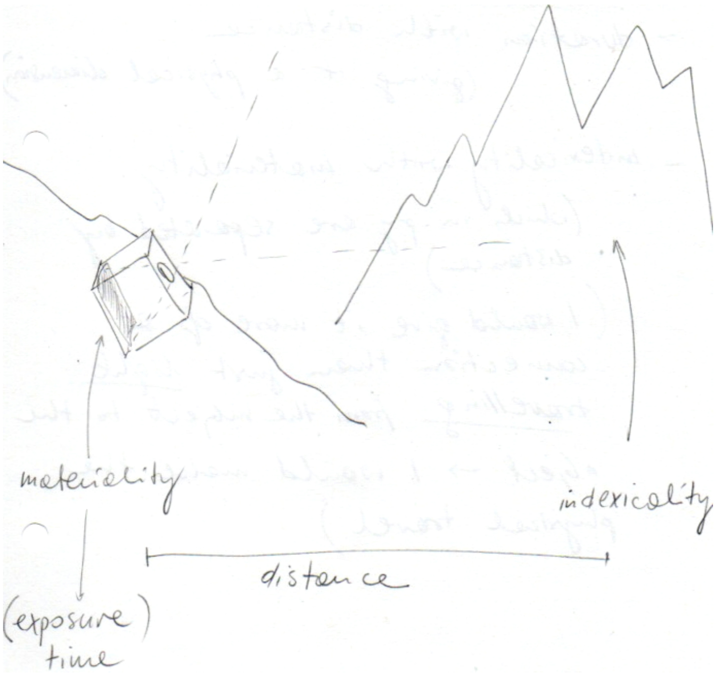

Figure 2.6. First sketch for the idea of a bottomless camera (paper lying on the ground) 11.6.11. Work by the author.

Figure 2.7. First test of a self-constructed bottomless camera (using the same 65 mm magnifying glass lens as the self-constructed A3 size box camera; it pointed towards the sky rather than the rock face on the opposite side of the valley, therefore no discernible features appeared in the resulting image; 11.6.11). Work by the author.

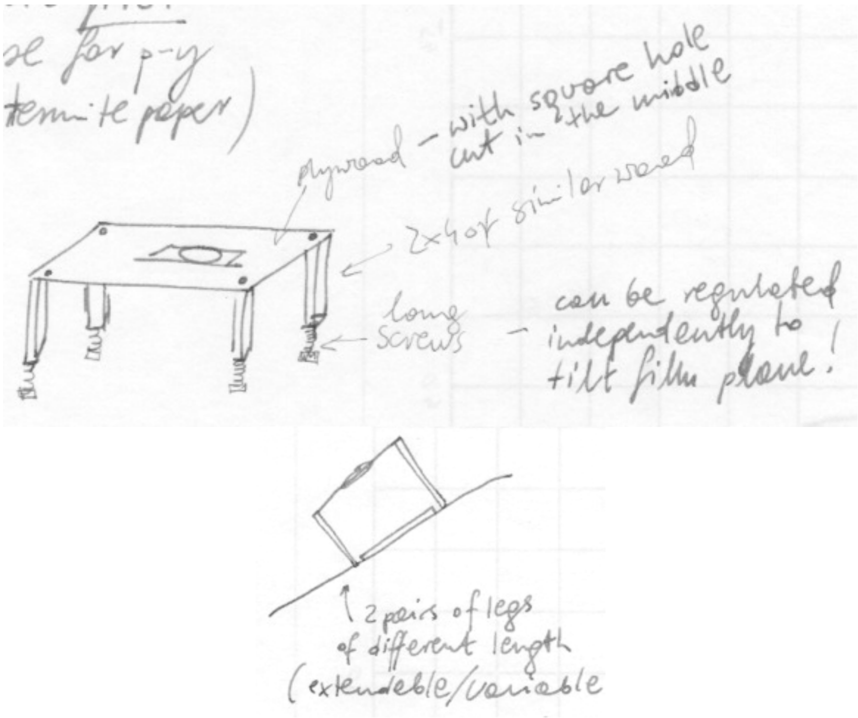

Figure 2.8. Sketches for a possible construction of the skeleton of a bottomless camera (June 2011). Work by the author.

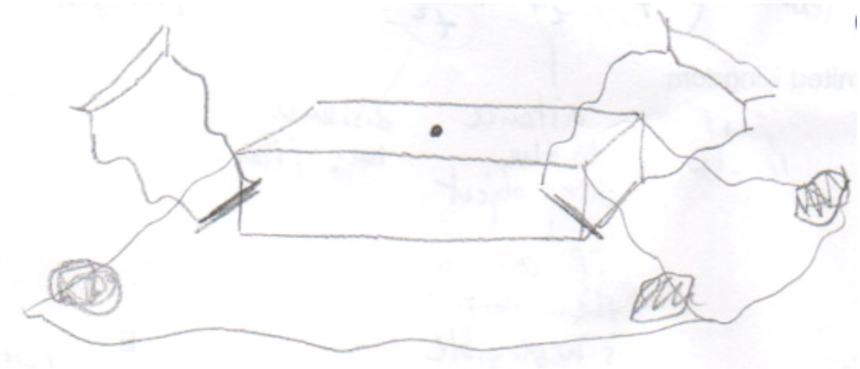

Figure 2.9. Sketch for a way to make a bottomless camera light tight while allowing access to operate inside through photographic changing bag sleeves (June 2011). Work by the author.

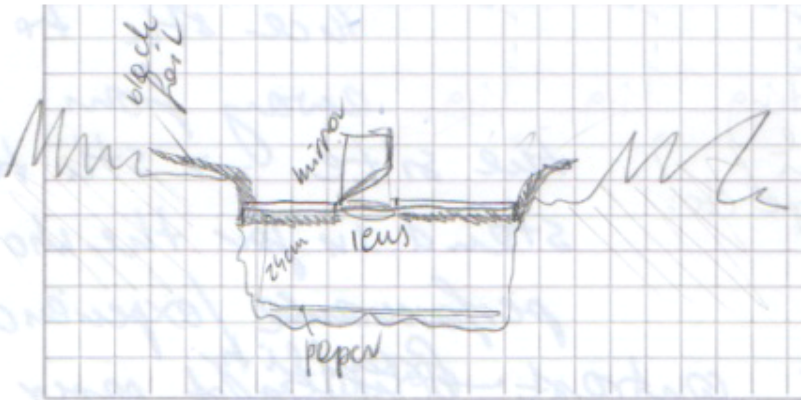

Figure 2.10. First sketch for a ‘hole in the ground’ camera (2.7.11). Work by the author.

Figure 2.11. First test of a ‘hole in the ground’ camera. Lens (focal length 26.5cm, which is also the depth of the hole) fitted into a board, with a mirror at a 45° angle over it, and black foil making the hole light tight. No aperture used, which makes it nearly impossible to produce a sharp image (July 2011). Work by the author.

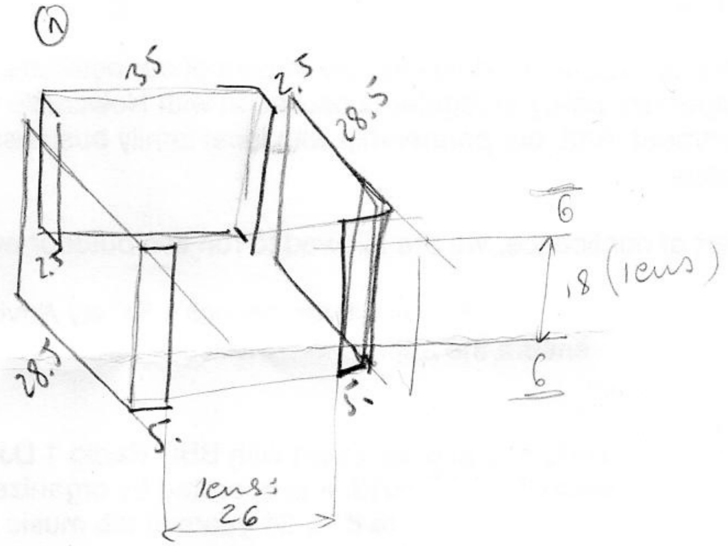

Figure 2.12. Sketch for the camera design used in 2013 to produce the final work. Folded Correx panels are easily transported and erected on-site. Screened paper is placed at the back wall and a lens fitted at the front. Top is covered with black foil to exclude light, and camera is stabilised on the ground by piling up rocks around it.

Building the photographic apparatus allows for an exploration of the degrees of intentionality and automaticity present in photography, which in turn pertain to indexicality as essentially a natural phenomenon not requiring human intervention. Vilem Flusser argues that it is the camera that is the real subject of photographers’ interest - it is “the obscurity of the black box which motivates photographers to take photographs”, “they creep into the camera in order to bring to light the tricks concealed within” (1983, 27). I would extend this claim to the processes of obtaining an image (some of which take place within the camera) and point to the work of the inventors of the medium (for whom the subject of their photographs and ways in which the technology could be utilized was of much less concern than finding a working method of obtaining and fixing an image[29]) as the best example. A desire to understand the technology the functioning of which evolved beyond our common knowledge and applying this understanding in making paper, sensitizing it, and constructing basic cameras serves to explore the indexicality and the involvement with materials present at the heart of making photographs as physical traces. But it also has wider implications for the issues surrounding technology and human engagement with it, which are explored in the next chapter.

Making paper

The necessary in-depth understanding of paper, papermaking, and the implications of contemporary hand-made paper production was gained through visiting twelve traditional European paper mills. During this time I talked to papermakers and took part in workshops in both European and Japanese papermaking by hand, led by world-class specialists Gangolf Ulbricht in Berlin and Caterina Dorello in Fabriano, Italy (appendix 5).

Having produced a body of work using a direct positive process in ‘hole in the ground’ cameras (*By the Aare* series resulting from an artist residency at the Altes Spital, Solothurn, Switzerland, September - November 2011; appendix 3; example in figure 2.13), the white, fine art paper stood out as the only element of the work that is foreign to the site of its making. I wanted to minimize what I needed to bring to a location, and use as much of what is already there as possible. I therefore started to make paper on-site from plants growing there. In the same way that I chose to work with the historic dimensions of photography, I chose to work with the earliest papermaking methods in order to stay close to the sense of what making a sheet of paper means in its most basic dimension - extracting fibres from available materials, suspending them in water and depositing them in a thin layer on a mould - as well as what it meant for the first papermakers to strive to obtain such a material. In my choice of techniques and materials I was also guided by the desire for the greatest possible immediacy in the way paper can communicate the process, place and time of its making through its visual, tactile and olfactory

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[29] Talbot’s *The Pencil of Nature* included architectural studies, still-lifes, close ups and facsimiles of prints, sketches and text. The publication aimed to showcase the multitude of uses to which his invention could be put, and Talbot appears to have largely left it for the future users to decide how his invention could be utilized (and therefore how photographs could signify). This variety clearly demonstrates his openness to what can be called the demands of the market.

qualities. The preceding extensive research about paper, similarly to the knowledge about photographic techniques, has alerted me to the subtleties of the material and the possibilities for experimentation within the papermaking process.

Figure 2.13. Digging the hole for the camera (left), and the resulting photograph (right). *By the Aare* series, *Hole I, Exposure I*, Talbot’s direct positive leucotype process in a ‘hole in the ground’ camera on Hahnemuhle Bamboo paper. Solothurn, Switzerland, 2011. Work by the author.

Early experiments were carried out in Paper Studio Northumbria, where various local plants were tested for their suitability for making paper to be used for photographic processing (this means good wet strength to withstand photographic processing, and no bleeding to produce a sharp image; details of the tests in appendix 6). Instructions from books on papermaking with plants were followed (Watson, Shannon, Hiebert, Lockie, Dawson). Grasses were found to be far more suitable than other plants on account of having long fibres, and a method of making paper on-site with the minimum of equipment was developed. In the chosen working method plants are collected, cooked, washed and beaten by hand with a stone (figure 2.14). The pulp is distributed in a self-constructed mould immersed in water of a stream or a lake, which is then pulled up and the paper allowed to dry on the screen (figure 2.15).

Figure 2.14. Beating cooked grass fibres with a stone. The making of *Cruschetta, towards Lorenziberg, Engadin, Switzerland, 2320m a.s.l., 26 Jun – 4 Jul 2013*. Photo: Ulrich Elsner.

Papermaking by hand using local plants allows for extending the idea of indexicality from the photographic image to the photographic object being made at the site of exposure out of materials available there. It also encourages a different perception of paper, more typical of Japan and China. Tadayoshi Nakabayashi (1991) writes:

> Intellect, emotion and volition comprise the mental factors of human beings and to me, it seems that 'intellect' permeates western-style papers while 'emotion' is interlocked into washi. Compared to Europe where the object of paper was thought only to transmit, record and preserve 'intellect', it seems to me that in Japan, 'emotion' was described and also fostered by this vehicle. (All Japan Handmade Washi Association, 90)

It is the hand-making process that brings Japanese and the Western approach closer, underlining the ‘feel’ of paper, which almost demands close attention as one works with it. To exploit paper’s full potential, as the artist and bookbinder Faith Shannon notes, one has to “become engrossed, appreciating the distinctive character of the sheet (…) by direct contact through the fingers” (7). In the directness and simplicity of the tactile involvement with the process there is found an enjoyment in the elements of craftsmanship: the gathering, cooking and beating of fibres; the pouring of the pulp; the screening of a sheet of paper. It is the ability of paper made by hand from plant fibres to communicate more than only that which is imprinted upon it that I wish to explore. Paper produced on-site and exposed in a camera becomes a photographic object that signifies indexically the place of its making through both material and image.

Figure 2.15. Screening paper. Still from the film material documenting the making of *Clemgia, Engadin, Switzerland, 1380m a.s.l., 6 & 8 July 2012.* Work by the author.

The pouring papermaking technique, considered by Dard Hunter, an authority on the subject, to be the earliest (83), is for me an equivalent of the direct positive process in photography. The final deposit of chemicals/fibres (and its texture) is created at the moment of making the exposure/sheet and no secondary operations like printing from a negative or pressing a sheet interfere with the final result. When paper is made by pouring pulp onto the mould and leaving it to dry, the structure of the mould is impressed on one side of the sheet, but the surface away from the screen retains the natural texture of dried intertwined fibres. When paper is pressed, on the other hand, both sides of the sheet take on the texture of the material they are forced against, in a negative-positive relation. Wet pulp acts as a receptacle, just like a light-sensitive photographic surface does. To retain the natural texture of the material appears to be equivalent to using an image formed directly in the camera in the way that both strive for the greatest possible immediacy regarding the event of their making. This relationship is one of indexicality in the strict understanding of the concept developed in the previous chapter.

Remote natural locations

The project is inextricably linked with the alpine region of the Lower Engadin where I have been developing the work over the three-year period. This was made possible by artist residencies in Switzerland: in Nairs, Scuol, in the summers of 2011, 2012 and 2013, as well as in Altes Spital, Solothurn, September-November 2011. The preference for working in the Swiss Alps – as opposed to, for example, other mountain ranges - is ultimately personal. The combination of the shape of the rock formations, the flora and fauna thriving in this harsh environment found at high altitudes, intensity of light and weather patterns has for me a resonance like no other region that I am familiar with. My involvement with the Alps reaches back to the time of my previous projects (in particular *The Walking Project* 2008-2010). The movement through the landscape, and the perception of the environment while walking are central to my practice. But while my previous work has dealt with long-distance walking, where no path is travelled twice, this project has benefited from an intimate knowledge of the locations I have been returning to again and again to realize the works. In my experience, through repeated movement up the same valleys and over the same passes, the body ‘remembers’ the space, and the space begins to feel like an extension of the body. The sense of sight plays for me only a minor part in this bodily perception of space, which encompasses equally that which is immediately visible (for example, this valley, this mountain) and this which is known to be there (the valley behind the mountain, the next mountain range, etc.). This realization, arrived at while walking, helped me understand why I do not seek to represent those locations in a purely visual manner, but rather to create their direct tactile impression.

The site in my work has a dual nature as both the view and the location where the paper and the camera were made: both sides of the lens (figure 2.16). This is clearly indicated in the titles, for example: *Val Urschai, towards Piz Faschalba, Engadin, Switzerland, 2120m a.s.l., 21 Jun – 1 Jul 2013*. The photographic image shows what was visible from the site, but hides the exact environs of the camera, while the plant paper reveals something about the location where it was made through its own composition, with the vegetation being clearly visible in its structure. The rudimentary nature of the image achieved when using the light-sensitivity of plant substances acts as a 'barrier' to the habitual looking *through* the surface of a photograph, where its objectness is easily overlooked and the experience becomes predominantly visual. Instead, mirroring my own perception of the environment described above, the work encourages a more multi-sensory response - because its tactile and olfactory aspects are as strong as the visual aspect, viewers become aware of their own body in relation to the object and the space. What is represented is primarily the site of making the work, rather than the view from the site. Analogously to my own perception of place, where the body is firmly grounded in its immediate surroundings through all the senses (sight having an equal but not greater importance than feeling or hearing), viewers apprehend the site as substantial (the material of the paper), and the view as intangible (tonal changes in the material).

Figure 2.16. The location where the paper and the camera were made, and the view towards which the camera (visible in the bottom left of the image) was pointed. Still from the film material documenting the making of *Furcletta, towards Piz Buin, Engadin, Switzerland, 2510m a.s.l., 14 – 25 Jul 2013.* Work by the author.

It is perhaps because of my ‘walking’, embodied relationship with the Swiss Alps that my connotations of the region are not predominantly visual, despite the fact that in the collective cultural imagination it functions as the epitome of ‘the scenic’. Attempting to represent alpine locations in ways other than visual can be seen as perverse, but it highlights perhaps all the stronger the dominance of the purely visual impressions in our interaction with the world. Although my own interest in the region does not stem from cultural connotations, it is necessary to acknowledge them as the context in which the work is read. In fact, I wish to juxtapose this culturally coded thinking about landscape with the understanding of place as elemental – that which cannot “be assimilated to the sphere of what can be governed, controlled, and ultimately (…) made, produced” (Sallis, 2000, 152). As such, high mountains are one of the environments most removed from the everyday human experience. To interact with them is to intentionally move away from valorizing the useful and the efficient, and to embrace the slow, difficult and purposeless (for example, making grass paper at altitudes where hardly any grass grows, figure 2.17). This brings to mind George Malloy’s famous statement that one climbs mountains because they are there.

Figure 2.17. Collecting the scarce grass available at high altitude. Still from the film material documenting the making of *Fuorcla Radönt, towards Piz Radönt, Engadin, Switzerland, 2700m a.s.l., 22 Aug – 4 Sep 2013.* Work by the author.

I was intrigued by the effect of combining an absurdly time- and labour-intensive technique of producing an image with a scene the significance of which is inversely proportional to the effort required to depict it. The feat aspect characterizing the technique is moreover extended to the journey required to make each piece. This has something in common with the first photographic exposures taken in remote locations, such as those from the Bisson brothers' Mont Blanc expedition in 1861, where the colossal equipment carried by 25 porters was commented on as much as the images themselves. "The more difficult the ascent, the more miraculous the photography appeared, precisely by suppressing this difficulty" (Caraion, 106). The knowledge of the rigors of the making of an image (Bissons' wet collodion plates could be ruined by the slightest change in temperature or atmospheric pressure, and for rinsing them, snow had to be melted over oil lamps that would hardly burn at that altitude) gives it a significance that is independent of its visual content. This knowledge is provided in my work through text – the titles specify the altitude at which each piece was made – and through film that reveals some of the harshness of the environment in which the photographs were produced (figure 2.18). The feat aspect of the work has the effect of validating the largely random choices involved in the making of each piece: which rock the camera is placed on, which bunch of grass is collected, which stone is the pulp beaten with etc.

Figure 2.18. Working at the foot of a glacier. Still from the film material documenting the making of *Fuorcla Radönt, towards Piz Radönt, Engadin, Switzerland, 2700m a.s.l., 22 Aug – 4 Sep 2013.* Work by the author.

Finally, there are practical reasons for choosing remote locations - they offer the right environment to carry out undisturbed the primitive procedures of making paper from found plants, building cameras partly from natural materials (figure 2.19), exposing and processing an image – or leaving the camera in-situ if extremely long exposures are required. Higher altitudes provide strong UV radiation that the photographic chemicals are most sensitive to, therefore considerably shortening the exposure (which, in case of utilizing the photosensitivity of plant pigments, lasts weeks, rather than months, as it would in Britain). Moreover, some of the processes used require strong sunlight to dry the paper, and temperatures within a certain range for the chemicals to work. Although the procedure of making the image largely relies on chance (no control over framing, level of exposure or processing, and no certainty that the camera will be there upon my return), exact locations are carefully selected. First, detailed maps are studied to identify sites that have a supply of fresh water to make paper (a mountain lake, or a relatively still section of a stream or a river), where fresh grass to make paper is likely to grow, where the mountain side not only has the right aspect for making an exposure but also faces another significant feature of the landscape (usually a peak)[30]. I then hike to those locations, and am usually able to find a spot where it is possible to make the work. Occasionally, the water source would be dry or frozen, it would be too high (or too early in the year) for the grass to grow, or the shape of the land would make it impossible to point the camera in a particular direction, and another location would need to be found.

Figure 2.19. Building a camera using natural features of the land such as the shelter of a large boulder. Smaller rocks are utilized to strengthen the construction. Still from the film material documenting the making of *Lai Blau, towards Piz Fliana, Engadin, Switzerland, 2660m a.s.l., 14 – 25 Jul 2013.* Work by the author.

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[30] Despite the primitive papermaking technique used, this requirement for particular conditions in not unlike the one that determined the location of traditional papermills, for which a specific water pH and shape of a stream were sought.

Physical involvement with materials and places

My involvement with materials when making work is linked directly with bodily engagement with the location where it is produced. Each place provides both the subject and the materials for the work made there. Over the course of the few hours it takes to collect grass, cook it, screen paper and set up a camera, I become familiar with the immediate environment. In my perception, it gradually develops into a particular place through the repeated movement and in direct relation to my physical presence within it. The body ‘measures’ the place against itself and ‘remembers’ it. In the words of geographer Yi-Fu Tuan, “what begins as undifferentiated space becomes place as we get to know it better and endow it with value” (1997, 6). Vision plays in this process a role equal to the other senses. In this respect, my perception of the subject of each work produced is very different to that of a photographer composing an image through a viewfinder of a camera. Although such physical involvement with materials is rarely the focus of contemporary photographers, I believe that it sheds light on the underlying physicality of the medium, which in turn is the necessary element of understanding it as an index-producing mechanism.

The chosen photographic and papermaking methods are characterized by a hands-on involvement with materials and embrace their agency, following the idea that artists “in part (…) know what they want, and in part they are just watching to see what will emerge” (Elkins 1998, 44). While re-creating early direct positive photographic processes, I found out that making photographs can still be in its essence an alchemical process each step of which has to be (re)discovered and the dilutions, temperatures, volumes, types of application and drying experimented with before arriving at any results. Without a solid knowledge of chemistry and the processes that take place, I was guided by what the substances look like and by how they behave as they are mixed, heated or cooled. Similarly, experimenting with making paper from plants is a matter of adjusting the multiple variables (the type of plant, cooking time, water pH, beating time, screening method, etc.) to achieve the desired result. However, it is the combination of the two – obtaining a photographic image using historic photographic processes on plant paper – that posed the biggest challenge (appendices 7-10). Over the course of using the chosen photographic and papermaking techniques, I have been time and time again, to quote the anthropologist Tim Ingold, “[f]aced with the anarchic proclivities of the materials” and had “to struggle to retain any semblance of control over what's going on" (2010, 94)[31] (for example, during the delicate procedure of applying wet collodion to plant paper, figure 2.20).

Figure 2.20. Still from the film material documenting the making of *Tiral, Engadin, Switzerland, 2587m a.s.l., 18 & 20 September 2012.* In this case, the wet collodion process was used. Work by the author.

Physical involvement with materials in the course of this project was central to developing the conceptual dimension of the work. The best example is my realization that the light-sensitivity of substances that are already present in the plant paper can be utilized to form a photographic image (figure 2.21; initial tests in appendix 11; in a photographic process called anthotype plant juices are extracted and applied onto another surface). This led not only to the simplification of the

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[31] The methodology of the creative processes of early photographic methods and of hand papermaking – but also of contemporary art making – can be thought about in alchemical terms. As argued by both the anthropologist Tim Ingold (2010a) and the art historian James Elkins (2000), alchemy is the most developed language of thinking in substances and processes, which is also undoubtedly what the first photographers and papermakers were involved in. For example, Graham Clarke writes that in the early years of photography "attempts to record and fix a permanent image were seen as almost magical in its effect and suggestiveness: an alchemical process of transformation akin to revelation" (11). It is clear from reading old photographic treaties and manuals, as well as the history of the invention of paper, that the origins of the two are steeped in a struggle with materials identical to that by which Elkins characterizes an artist's studio, comparing it to a laboratory where one spends long hours "struggling with materials and not quite understanding what is happening" (1998, 17). Moreover, it is not uncommon to find references to magic both in early photography and in papermaking. Talbot described the process that lies at the very heart of photography thus: "The most transitory of things, a shadow (…) may be fettered by the spells of our *natural magic*, and may be fixed for ever (…)" (in Newhall, 1980, 25), while a cotemporary writer on hand papermaking begins her book with the words: "A book of spells for plant magicians" (Lorente, 7).

process but, more importantly, to a greater unification of the distinct stages of papermaking and photographic exposure. It was no longer necessary to sensitize the paper with chemical substances, which necessitated additional steps of drying the screened paper and following a sensitizing procedure that in case of some processes was quite complex and time-consuming. The paper could be screened and placed in a camera straight away while still wet (protecting it from excessive exposure to sunlight to preserve the photosensitive substances that react to light during exposure). The final body of work produced in the summer of 2013 was made using this method (appendix 12). The fact that the photosensitivity is a property of the paper itself clearly demonstrates the material dimension of photographic image-formation.

Figure 2.21. An early test of light-sensitivity of plant substances present in the paper made out of fresh grass, carried out in Paper Studio Nortumbria. Exposed in a box camera fitted with a 20x26.5cm Fresnel lens, 34cm focal length, exposure time 21 days. Hole burnt by the sun falling into the lens. 6 - 27.2.13. Work by the author.

Andy Clark, a leading scientist in mind extension, argues that “creativity is a process that goes on all the time in the circulations and fluxes of materials – their movements, mixtures and bindings are creative in themselves” (in Hallam and Ingold 2007, 11). Strictly speaking, according to philosophers such as Bergson (and contrary to the philosophy of Enlightenment), creative agency resides neither in people nor in things, but rather ‘possesses’ the entities that are caught up in it – it is the generative flux of the world itself. In this way of thinking, “humans do not, through their creative interventions, transform the world from without, but rather – belonging within it – play their part in the world’s creative transformation of itself” (ibidem, 53). This is not unlike the early photographers’ perception of the medium as “spontaneous reproduction of the image of nature” (Daguerre, 1839) or “the process by which natural objects may be made to delineate themselves” (Talbot, 1839). I see my role not as much as that of a creator, but of a facilitator putting natural processes in motion by intentional interaction with materials.

Films

Producing and exhibiting films that document the process of making each photograph alongside the pieces has emerged as an important way of investigating the indexicality of the photographic objects being produced. Their role has shifted in the course of the project from that of providing information (that is, Peirce’s ‘independent knowledge of the circumstances of production’ of an index) to being a further means of investigating the process of meaning-making in response to an index. While the photographs are indexically pointing to the event of their making, and only optionally iconically pointing to their referent (that is, if the image is discernible - the causal relationship between an index and its referent being only optionally self-evident), the films are iconically pointing to the process of making the photographs that lies at the heart of the work (figure 2.22). To this extent they become the signifiers while the photographs act as the signified. I briefly summarize the process of working through the issues that emerged during the project in relation to the films (and in the next section – in relation to exhibiting the work) in this chapter, before analyzing both in more detail the fourth chapter.

Figure 2.22. Still from the film material documenting the making of *Fuorcla Davo Dieu, towards Piz Fenga, Engadin, Switzerland, 2600m a.s.l., 31 Jul – 12 Aug 2013.* Work by the author.

It was after much debating that the films were included as an element of the work in its final form. Although they accompanied the photographic objects produced in this project from the first exhibition (which followed my residency in Solothurn, Switzerland, September - November 2011), their richly visual, high-tech character appears at odds with the subtle, tactile and primitive nature of the objects themselves, and distracts from the experience of the latter if the installation is not planned carefully (figure 2.23). However, the stark contrast between the viewing experience of the very tactile photographs and the intensely visual and - in the understanding of the relation between image and object that this project develops, where the image is not independent of its support - largely immaterial films might be used to the work's advantage. It constitutes a fertile ground for exploring the issues of 'transparency' of photographic/filmic image resulting from iconicity having an overbearing effect over other modes of signification. The films might also be understood as a 'translation' of the photographic objects that attempt to represent place as elemental, from a more-than-human[32] perspective, into the culturally coded language of visual images. The combination of the two modes of representation highlights that which perhaps too often remains unnoticed - the

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[32] This phrase, and the prefix 'more-than-' in general, has most likely been popularized by cultural geographers discussing non-representational theory (for example, Lorimer 2005, 2008). It is also used by David Abram in *The Spell of the Sensuous: Perception and Language in a More-Than-Human World* (1997).

differences in the embodied experience of objects and the visual experience of images, and in the type of information that each can communicate. Early on in the project the films were displayed on small monitors next to the objects – the first two exhibitions featured eight such sets (figures 2.23, 2.24). The intention was to allow viewers to piece together knowledge of how the photographs were made from looking at fragments of the films, all present in the same space, rather than to have them watch all the films from start to finish. I was interested in showing a very realistic film representation of the place depicted in the mostly very ambiguous, obscure (through blur or underexposure) photographic images, and seeing what this contrast would produce.

Figure 2.23. *By the Aare* exhibition, Altes Spital, Solothurn, Switzerland, November 2011. Installation view of works produced during the residency in Altes Spital, Sep-Nov 2011. Work by the author.

The second exhibition, *Digilogue* in Newcastle (March 2012), attempted to address the problem of a delicate photographic object and a digital screen displaying a film clashing excessively when positioned next to one another. The screens were placed over rather than level with the boxes (which were spotlighted and encouraged a close study of their contents) so that viewers needed to step back to see them, and could not look at both simultaneously (figure 2.24). However, it was still apparent that the two require very different kinds of attention. Moreover, since those two exhibitions, I began to edit all subsequent films to the same length and following the same structure, i.e. if they were to be shown next to each other like in those installations, every part of the process of making the work would last exactly the same length of time in all the films. This internal framework matches in some respects the set method and equipment for making the photographs.

Figure 2.24. *Digilogue* exhibition, Unit 44, Hoults Yard, Newcastle, March 2012. Installation views of the works produced during the Altes Spital residency, Solothurn, Switzerland, Sep-Nov 2011. Work by the author.

Later I have changed from displaying the films on screens to projecting them on a single projector (one after another rather than running alongside each other). This allowed for their appreciation in their own right as visually-rich depictions of the places and my actions within them (something the small monitors did not fully convey), and, more importantly, for an experience of an image as a disembodied projection of light, differing radically from the experience of the photographic objects. Moreover, I sought to create a situation where viewers would see the pieces first, and only then access the films, never seeing the two simultaneously (*n-lôg, -lg* exhibition in Newcastle, May 2013, figure 2.25). But the need to control viewers' experience in terms of the order of seeing the objects and the films was problematic, as was the dependence of the photographs on the information contained in the films. As the work matured and the conditions of its reception were refined, it became clear that the films could play an important role in exploring how indices are interpreted *not* in the *presence* of knowledge about their making, but rather in its *absence*. By editing the film material not to document, but only to give an indistinct sense of my interaction with the land and of the physical effort and time required to make the photographs, a single film was eventually made that is as ambiguous in relation to the photographs as the latter are in relation to the places they represent.

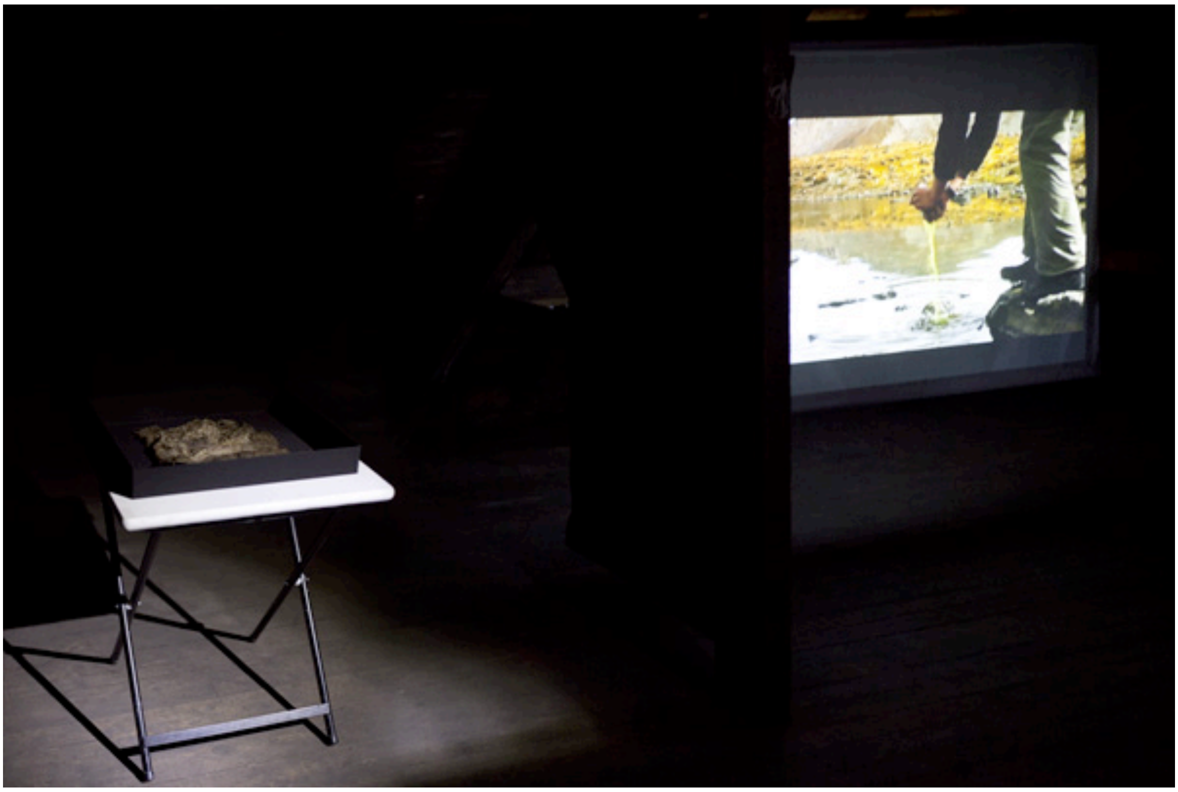

Figure 2.25. *n-lôg, -lg* exhibition, Unit 42, Hoults Yard, Newcastle, May 2013. Installation view of the work *Tiral, Engadin, Switzerland, 2587m a.s.l., 18 & 20 September 2012,* consisting of plant paper exposed photographically, shown in an open box on a table, a projection of the film documenting its making, and the title located on the exhibition handout. Work by the author.

Exhibitions

Aside from the developments described above concerning the films, exhibiting the work in various contexts has also greatly influenced my assessment of how the conditions of reception influence the way the pieces are read and understood by their viewers. Since the objects are not immediately identified as photographic, the space in which they are located can provide the Peircean ‘independent knowledge’ necessary to recognize an index as such. Or, to use another term introduced in the first chapter, the pieces rely on the space to establish a certain semiosphere - a set of meanings derived from the context that influence their interpretation. For example, the first exhibition was organized in a soon-to-be-dismantled photographic darkroom (figures 2.23, 2.26). Although I proposed this space mainly to celebrate its activity throughout the years that was now coming to an end, it soon turned out that the specific environment drew attention to the hand-crafted nature of the displayed photographic objects by conjuring up many viewers’ own haptic and often very distant experiences of manipulating photographic materials. Despite the works in this exhibition clearly representing pictorially (figures 3.11, 3.16), the context of a darkroom would have had an even stronger influence on directing viewers' reading of the pieces were they non-pictorial (like the later works in the project).

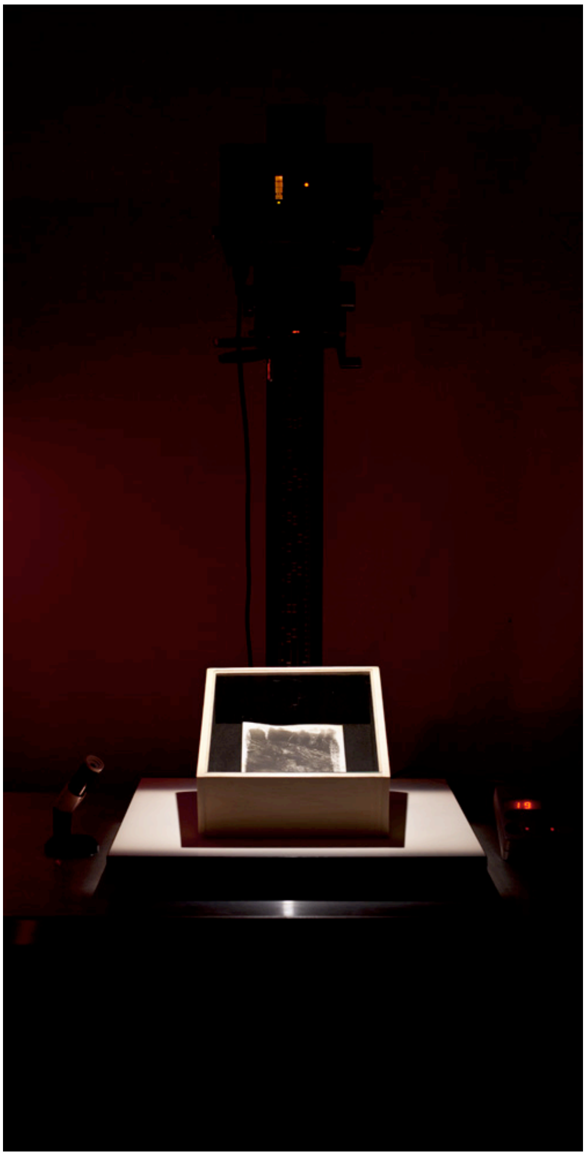

Figure 2.26. *By the Aare*, Altes Spital, Solothurn, Switzerland, November 2011. Exhibition leaflet showing the installation of the objects-photographs displayed in boxes and spot-lit with darkroom enlargers. Work by the author.

Being immediately recognisable as photographs in itself constitutes a semiosphere, a context for interpreting the works, but without them being formalised in this way viewers are left in a non-interpretative void looking for other indicators of meaning. This reliance on the spatial context to generate meaning became evident as soon as I began making plant paper and the works did not have a clearly recognizable photographic image. The discussion during the Open Studios Day in Nairs, 2012 (figure 2.27) has shown that merely accompanying the objects by text was not enough, and that the context needs to be controlled much better - the studio space provided only irrelevant and conflicting indicators that seemed to overwhelm the pieces.

Figure 2.27. Open Studios Day discussion about the work in Nairs, Engadin, Switzerland, 16.9.2012. Works by the author positioned slightly above the surface of a raised platform. Photo: Gisela Göttmann.

This impression of the room overbearing the works has led me to experiment with the amount of visual information surrounding the pieces. I sought to create an installation where the work would 'monopolise' viewers' field of vision, making it impossible to see simultaneously the piece and that which is positioned outside of its immediate context. My intention was to suspend (or at least diminish) the effect of the semiosphere of the space where the work was located. For the *New Curators North East* exhibition in Sunderland, November - January 2012, I constructed a deep freestanding box that viewers needed to peer into through a little opening at the top (figure 2.28). This allowed for a complete control of what is in their field of vision when they look at the photograph, including control of the angle and tone of light illuminating the paper (LED lights were positioned out of view in the box). The inner walls of the box converged slightly towards the bottom, increasing the perceived distance to the piece.

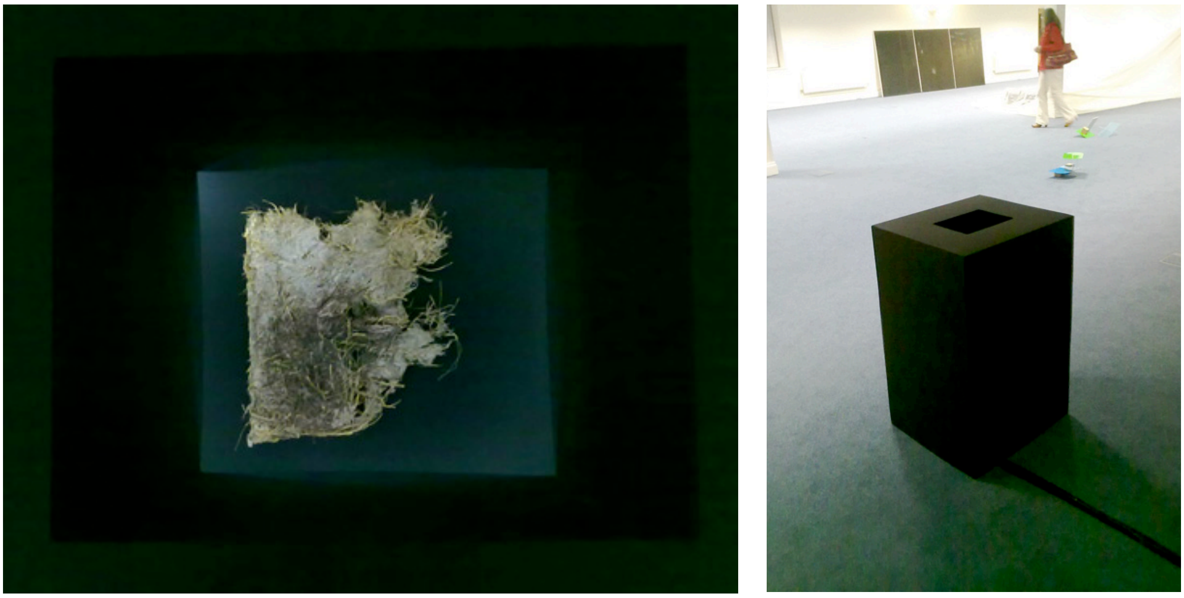

Figure 2.28. Installation views of the deep box at the *New Curators North East* exhibition, Departure Foundation in Sunderland, containing the piece: *Lai da Minschun, Engadin, Switzerland, 19 & 30 July 2012*. Left: view from above into the box. Right: view of the box in the space. Work by the author.

While the deep box had the effect of somewhat disembodying the gaze (the room in which viewers' own bodies are situated becoming invisible for the duration of the experience of looking into the box), I subsequently aimed at a suspension of the sense of viewers' bodies in space by creating an immersive experience and building installations in completely blacked-out spaces with the works apparently floating illuminated in the darkness (December 2012 - February 2013, not exhibited publicly). The pieces were initially positioned horizontally on stands and illuminated from above (figure 2.29), and later irregularly placed on the walls[33], either floating about 10cm away from the wall (figure 2.30) or each placed in a niche about 40cm deep (figure 2.31). In the latter two cases, viewers were given very dim torches, the light of which was not enough to see anything at first when they stepped into the space. The size of each space was not obvious from the outside, unless viewers were already familiar with it. This design was intended to result in a moment of disorientation when one does not know anything, and thus perhaps comes close to experiencing a suspension of a semiosphere.

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[33] The walls were lined with black cloth so as to create an impression of total darkness. With the previous installation where works were placed horizontally on stands in a blacked out space the walls were left white and I found that even with a small amount of light in the space the whiteness of the walls became visible as the eyes adjusted to the darkness.

Figure 2.29. Installation view of works in a dark space, positioned horizontally on approx. 1m tall stands and spot-lit (December 2012). Work by the author.

Figure 2.30. Installation view of works in a dark space, placed 10cm away from the wall – viewer looking at a work using a torch (February 2013). Work by the author.

Figure 2.31. Installation view of a work in a dark space with the piece placed in a niche – lit by a torch held by the viewer (February 2013). Work by the author.

The theatricality of those installations (as well as, to an extent, the installation of previous exhibitions, where the pieces were spot-lit), however, was at odds with the essence of the photographs themselves. It prioritized visual reception, while the pieces are created primarily as artefacts, or material traces of a place. To acknowledge the inherent non-visuality of the photographs - to free them from the context of 'display' and instead to underline their physical presence - I eventually decided to place them in boxes that viewers need to handle in order to see the pieces. In some exhibitions that took place during the course of this project this idea was partly compromised as the boxes were placed on tables or shelves and left open (figure 2.25). An idea of having a handler who, at viewers' request for a particular work chosen from a list of titles, presents them with the box picked from a stack or a shelf, was briefly considered but dismissed as overly performative and ultimately taking away from the quiet experience of the subtle objects[34].

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[34] Having a handler appeared all the more suitable since the feedback from my presentations during the Open Studios Day at Nairs in 2013 suggested that including an element of human interaction might greatly add to the works' reception. The audience in Nairs has found the performative aspect of myself unpacking the pieces *during* (rather than before) my talks intriguing and relevant to the work – it heightened their curiosity of what the pieces actually look like (the works were stored in black foil to protect them from light). The idea of having a handler in an exhibition context seemed to offer a possibility of including a similar element of human interaction in the viewing experience. This was thought to have an effect of increasing viewers' commitment to spending time with and understanding the work, and of lowering the possibility of them

Eventually, the boxes were positioned on a table to be opened and closed by viewers themselves[35]. I evaluate further the different ways of showing the work that I have outlined above, and discuss the implications of the final installation decisions, in the fourth chapter.

Chapter conclusion

The artistic practice at the core of this research includes immersing myself in the natural environment of remote alpine locations, making paper on-site, exposing it for long periods of time in cameras built there, filming the process and exhibiting the results. It forms the basis for investigating photographic indexicality from the distinctive perspective of a maker involved in the fluxes of materials, and a walker engaged physically rather than only visually with the surrounding environment. The particular papermaking and photographic processes were chosen in order to strengthen the physical link between the produced objects and the time and place of their making. The working method developed over the course of the project produces a unique photograph directly in-camera, out of plant materials available on-site and using their inherent light-sensitivity, and eliminates the enclosed space of the camera in favour of allowing the photograph to come in contact with the environment. The resulting objects function as indices of the time and place of their origin in the strict semiotic sense of the term outlined in the previous chapter – they communicate their causal relationship to the event of their making through their physical presence rather than through pictorial representation. They allow therefore for an investigation of the meaning-making process in relation to a photograph as an index that is shaped by the direct experience of an object, by the spatial context in which it is positioned, and by the information contained in titles and textual description on a label. This is explored further through the film that shows myself making the photographs, but which – despite representing pictorially - is in its final form similarly ambiguous in relation to the photographs as the latter are in relation to their referents. The next chapter

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skimming over it and ‘missing the point’. However, it was eventually decided this would have been unnecessary and would have taken away from the experience of the works. Moreover, the element of uncertainty at revealing an unfamiliar object is also present when viewers need to open the boxes themselves, while the information about the making of the pieces that I communicate in person during presentations is provided through the film.

[35] This involved modifying the construction of the boxes so that the lids would not be allowed to fall all the way back when not supported, and fixing the boxes to the table so that they would not slide when handled.

analyses how, by foregoing the illusion of depth in favour of the viewer’s tactile response, the photographic objects question the dominance of sight in the full, embodied experience of the world.

Chapter III. Photographs as material indices representing place

The first chapter demonstrated the theoretical possibility of indexicality of photographs existing independently of their iconicity and expressed in their materiality. Here I wish to determine how the chosen methods of making photographs described in the second chapter not only reflect the theoretical argument, but take it further through their involvement with the physical world rather than the world of ideas and language. I want to propose that photography understood as a physical trace-making process is a suitable medium for representing place as elemental - that which is sensible but cannot be reduced to the human world; we perceive it but it nevertheless exceeds our perceptual field and resists being formalised into a closed system. As objects, the sheets of grass paper made on-site and exposed in cameras built partly out of natural materials communicate meaning in ways that go beyond not only the coded system of signification of language, but also that of visual representation. They are therefore able to convey something of my own embodied perception of a site that eludes photography understood only as an image-making process. Places are experienced as ever-changing environments that one is immersed in, rather than flat tableaux that the word ‘landscape’ often conjures. In attempting to express some of this complexity, my work discloses the failure of images “to capture natural phenomena and the fullness of sensation when the body comes into contact with them” (Boetzkes, 18). As physical traces, the photographs propose their own ‘language’ that is developed from an aesthetic, sculptural and conceptual sensibility.

This chapter analyses the implications of my chosen method of making photographs described in the previous chapter in a wider context. The question of how place as elemental can be represented photographically is framed here against the background of a particular ‘scopic regime’ of disembodied observation that arguably characterizes our age. I begin by proposing photographic technology and apparatus as instruments of this regime that can nonetheless be used to subvert it by producing results that go beyond such cultural constructs as ‘landscape’. I then determine the significance of the absence of the visual in such representation. Finally, I discuss three elements of the work that emerge as significant to communicating meaning in place of the photographic illusion of depth: its objectness, its materials and its surface as opaque rather than ‘transparent’. Throughout, the viewpoint is that of my own interaction with the environment as I walk through it and make the works. I argue that as far as photographic technology is designed to fix the visible, and its results are usually interpreted in terms of meaningful visual signs, it captures the world exclusively from the perspective of a disembodied spectator rather than an embodied entity actively participating in the surrounding world. To represent place as elemental it is necessary to go beyond the constraints of the apparatus yielding predictable visual results. It is to communicate meaning not through an image, but through the surfaces of the objects being opaque and returning the gaze, through their presence, and through the materials they are made of. This chapter is concerned exclusively with the photographic objects, rather than with the film that pictorially shows my interaction with the environment while making them (which needs to be understood in relation to the objects and is analysed in the next chapter).

Indexicality, technology and representing place

When thinking about how purely indexical photographs can represent, a good place to start is the photographic apparatus, in particular my ‘hole in the ground’ cameras and other types of cameras built on-site, since what is perhaps primarily at stake in the debates about technology is its (in)ability to represent any more-than-human otherness. The automaticity of the medium, its potential to record everything indiscriminately without assigning it meaning and irrespectively of photographer’s intentions, is often taken as enabling photography to express something beyond the human world: as Rosalind Krauss has written, “it is the order of the natural world that imprints itself on the photographic emulsion and subsequently on the photographic print” (1977b, 59). In the postmodern context, photography appeared valuable as an art that could undo what Jacques Ranciere called the “modernist project of separation” – “the project of separating the artwork from the world by separating it both from the things it represents and from the spectator to whom it represents them” (Michaels 2011). While literature or painting can, for Ranciere, only imitate non-art by artistic means, photographs necessarily *are* non-art, in the sense that, to use Susan Sontag’s oft-quoted words, they “do not seem to be statements about the world so much as pieces of it” (4). Even as an “intentional production of art which seeks an end” (Michaels 2011), a photograph nonetheless provides what Ranciere characterized in terms of a response to the Kantian appeal to an art like nature: “the sensible experience of beauty without end” (ibidem).

On the other hand, as some theorists argue, cameras are man-made and therefore unable to produce anything that does not belong to the human world. Flusser writes that photographer’s intentionality operates within clearly delineated boundaries of the possibilities of the medium, which have been shaped by the conventions of communicating meaning that both the maker and the audience are familiar with. The camera appears here as a programmable apparatus that, paradoxically, programmes the photographer (functionary) who uses it[36]. A programme is a set of possibilities, a “combination game based on chance” (1983,

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[36] Flusser makes a distinction between tool, machine, and apparatus (1986a). When using tools, man is surrounded by them and may exchange one for another. Machines, on the other hand, are operated by men that can be substituted one for another. In case of apparatus, there is “an intricate co-relation of functions: the apparatus does what man wants it to do, but man can only want the apparatus to do what it can do” (1986a, 357).

69), with clear and distinct elements, that serves to animate the apparatus. As Flusser puts it, “every photograph is a realization of one of the possibilities contained within the program of the camera. The number of such possibilities is large, but it is nevertheless finite” (1983, 26). ‘The photographic universe’ is a closed system that not only fails to represent phenomena, but also excludes them.

This holds true insofar as photographs are routinely obtained through the automatic application of lenses, films, developers, and fixatives (each of which is a result of a global machine of designing, producing and marketing), and the photographer’s intervention, as Van Lier notes, is purely optional. It is difficult *not* to produce an image resembling what was in front of the lens using a modern camera. For most camera-users photography remains what Van Lier describes as “the most vivacious experience of what physicists call the *black box,* where one can clearly perceive the entrance (input) and the exit (output), without even knowing quite well what takes place between the two” (38) (photography always takes place in the dark: in film rolls, cameras, darkrooms). However, artists have often brought this automaticity into question – for example, Steven Pippin constructs cameras out of washing machines, bathtubs, fridges, wardrobes, toilets, etc. and produces images removed from the human perspective that the usual apparatus is designed to replicate. His pieces are open to chance occurrences that manifest, for example, in the random pattern of scratches resulting from processing photographs in a spinning drum (figure 3.1). Driven by a desire to understand the technology the functioning of which evolved beyond our common knowledge[37], he subverts the design of cameras as fixed-function and user-friendly. The latter, in Richard Sennett’s words, “ask for submission rather than engagement” (9), rendering their users passive, no longer curious about why and how things work. A modern camera “minimize(s) the experience of mechanical resistance” (Sennett, 8) and, in Martin Heidegger’s terms, “conceals itself as to what and how it is” (17).

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[37] When asked about his aim, Pippin replied that “he became interested in how things worked, the mechanical apparatus of our lives that we take for granted, when he saw his father repairing a television set: 'this great chaos of wires which he seemed to understand'” (Adam 1999).

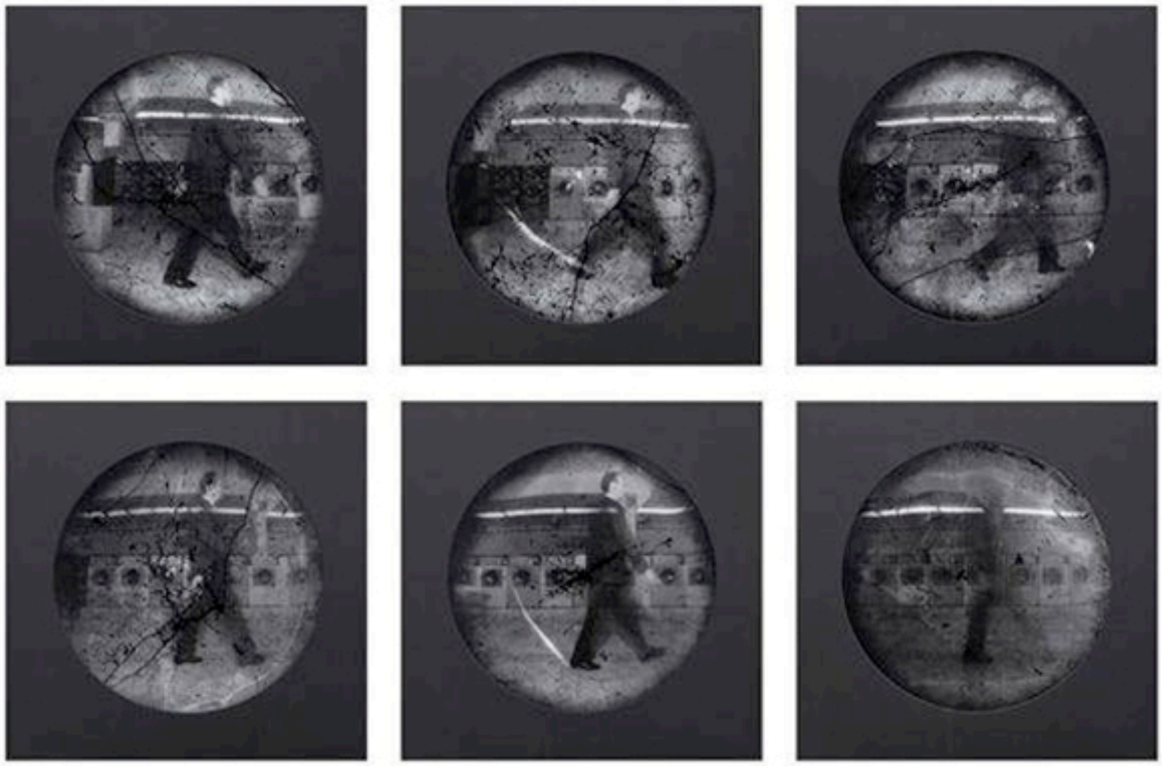

Figure 3.1. Steven Pippin, *Laundromat Locomotion (Walking in Suit)*, 1997. Source: www.tate.org.uk.

The making of paper and primitive cameras as it appears in my practice has a similar effect of disturbing the system in which, in Van Lier's understanding, the initiative of the photographer comes after the initiative of the technician (53). It is in tune with Flusser's argument that a truly experimental approach to technique (a literal deconstruction of the apparatus) is necessary to short-circuit what could be called the limitations of the apparatus designed to be predictable – and designed to yield photographs representing iconically. In my work, the formation of a sheet of paper and of a photographic image is constantly at stake (figure 3.2). Although the result is not an increased control of the process, but rather forgoing much of the control that comes with modern equipment and processes, such an act against the automatic programming of the apparatus, to use Flusser's terms, paradoxically creates space for human intention (1983, 74-75). Flusser sees 'experimental photographers' as addressing the question of freedom in a world dominated by apparatuses, as "they are consciously attempting to create unpredictable information, i.e. to release themselves from the camera, and to place within an image something that is not a program" (1983, 81).

Figure 3.2. Building a camera that was damaged when I came to collect it after 6 days, with the paper missing. Still from the film material documenting the making of *Pass da Costainas, towards Piz Madlain, Engadin, Switzerland, 2280m a.s.l., 10 – 16 Jul 2013*. Work by the author.

In Heidegger's terms, the technology of photography can be said to turn reality into a standing-reserve of images, inasmuch as cameras are on 'stand-by' to ensure the possibility of taking a picture. Photography facilitates a 'revealing', but not in the sense of 'bringing-forth' that takes place when a craftsman gathers together matter, form and a view to the thing envisioned as completed (the four elements – the fourth being the craftsman himself - of causality in classical philosophy) (1977, 6, 13). Rather, this 'revealing' is a 'challenging' of reality into putting out images (1977, 14), it is a technology that transforms, stores and distributes them, characterized by regulating and securing itself (16) (the camera ensures the right degree of exposure and preserves the image). By turning the real into a standing-reserve of images, the technology of photography renders it "unautonomous", unable to "stand over against us as an object" (1977, 17). It is therefore unable to represent what Heidegger elsewhere (1971, 46-47) characterizes as withdrawing and unyielding - the earth as an irreducible elemental, as that which withholds itself from being known.

Representing place as elemental rather than as 'landscape'

Our most immediate experience of things is that of a reciprocal encounter with "the manifold textures, sounds and shapes of an animate earth" (Abram 1997, 22). The earth as elemental forms a constitutive basis for all perception, and our senses complement each other, coherently converging in the perceived thing and enabling its recognition as "another nexus of experience, as an Other" (Abram 1997, 61)[38]. Edward Husserl argues: "bodies are given as having the sense of being earthly bodies and space is given as having the sense of earth-space" (1981, 227). Earth, therefore, determines one's sense of movement, stillness, space, and other bodies. Walking in the mountains and producing the works out of materials belonging to particular places, I do not think of this environment as 'landscape' - the word connotes a particular 'scopic regime' of detailed and disinterested observation that is the antithesis of my immersion through the sensory experience of light, sound and feeling in what Tim Ingold calls the fluxes of the 'weather-world' (2011, 126). By conceptually immobilizing and objectifying a phenomenon we "deny its ability to actively engage us and to provoke our senses: we thus block our perceptual reciprocity with that being" (Abram 1997, 56). This effect is characteristic of photographic cameras' tendency to act as a filter through which the photographer visually experiences the world. It became particularly evident with the widespread use of digital cameras, characterized by their almost limitless capacity to store images, the ease of deleting unwanted ones, and no cost of rolls of film and its processing. It is also commonly acknowledged (as the satirical cartoon in figure 3.3 demonstrates). A newspaper article points out that tourists encountering an explanation board of a tourist attraction today are as likely to take a picture of the text as they are to read it – not to mention photographing countless scenes already proliferating on postcards or in other tourists' cameras (Metzler 2013). Although many accept that the constant looking through the viewfinder disturbs the actual experience, they nonetheless give in to the urge to preserve each moment and organize them on a hard drive, believing they can be relived later at ones convenience (ibidem). "The faith in perception", in Virilio's words, becomes "slave to the faith in the technical sightline" and "the visual field [is] reduced to the line of a sighting device (…) projecting an image of a de-materialising world" (1994, 13)[39]. Such reduction of the surrounding world to a set of visual signs thwarts the attunement to the sensuous world. As Abram writes,

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[38] John Sallis, analyzing Emmanuel Levinas's philosophy, writes of nature as "the absolutely strange. (…) another alterity" (1998, 153); as having forsaken "its immediacy and familiarity", "appear[ing] strange, as if belonging to a region distant from and alien to the human world" (1998, 152).

[39] The artist John Baldessari has said: "probably the worst thing to happen to photography is that cameras have viewfinders" (in Iversen 2010, 140). While modern photographers devote much of their attention to framing the subject, early photographers were much more concerned with the technique and the apparatus itself.

> Transfixed by our technologies, we short-circuit the sensorial reciprocity between our breathing bodies and the bodily terrain. Human awareness folds in upon itself, and the senses – once the crucial site of our engagement with the wild and animate earth – become mere adjuncts of an isolate and abstract mind bent on overcoming an organic reality that now seems disturbingly aloof and arbitrary. (1997, 267)

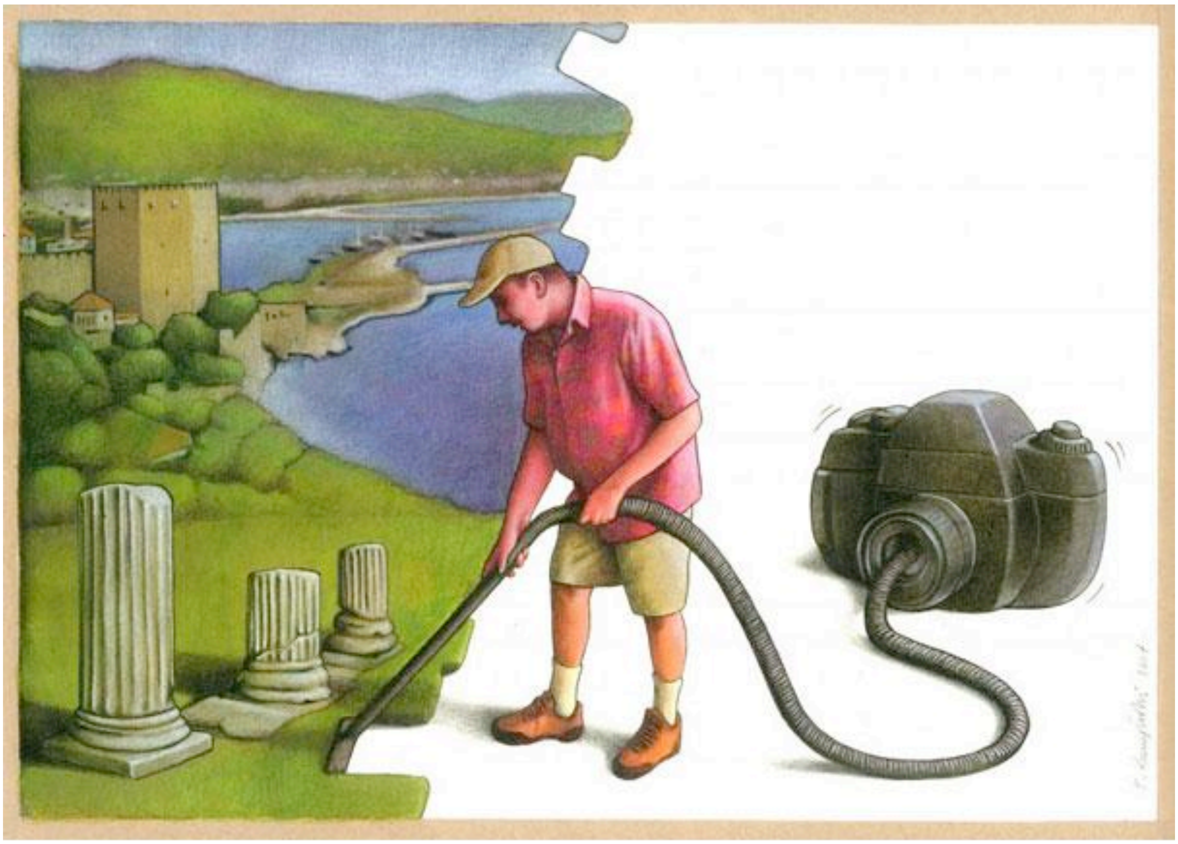

Figure 3.3. Pawel Kuczynski. Source: http://www.visualnews.com/2011/03/01/drawing-on-world-issues-illustrations-that-make-you-think/.

In the extreme, photographic images replace the physical interaction with the world in what Virilio called the ‘logistics of perception’ – “a phenomenon of acceleration obliterating out experience of distances and dimensions” (1994, 4). One of the results of viewing the world as an image projected through optical devices - starting with the first camera obscura in the tenth century[40] – is the concept of ‘landscape’. It describes a visual rendering of the world that, as Ingold asserts, “allows it to be viewed indirectly, [and] returns [it] back to the viewer in an

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When Daguerre first demonstrated his process, it struck one journalist that “The director (for I cannot call him the operator) cannot see by the plate how the process goes on, experience alone can tell him how to judge as to the advancement which the action of light has made” (in Batchen 1999, 119). Without viewfinders, photographers look *at* cameras, not *through* them, and therefore perhaps remain more conscious of the position of themselves and their apparatus in relation to the physical surroundings.

[40] Al-Hasan ibn al Haitam aka Alhazen’s camera obscura was followed by Roger Bacon’s instruments in the thirteenth century, and an increasing number of visual prostheses, lenses, astronomic telescopes etc. from the Renaissance on (Virilio 1994, 4).

artificially purified form, shorn of all other sensory dimensions" (2011, 136). But photography and other visual media cannot communicate a fullness of experience, as artworks such as Douglas Huebler's *Duration Piece #5* (figure 3.4) demonstrate. In 1969, Huebler made a walk in Central Park and shot a picture with a camera pointed in the direction of a birdcall whenever he would hear one. The resulting images are arbitrary to the parameters of their making that rely on the experience of sounds. The confidence in disembodied seeing appears to me to result from the fact that more often than not people in the developed world perceive the land from the perspective of a car-, train-, or bus-seat. Seeing is mistaken for being in the space and perceiving it bodily. As Virilio writes, "the verisimilitude [of the habit of velocity] alienates us to the point of eliminating the optical effect of celerity, thereby normalizing the blurring of perception caused by acceleration" (2005, 121). In my experience of a walker embodied perception of space is disturbed by shuttling the body between places and has to be regained every time I step off a car or a train. Another of Virilio's assertions rings true: "motors, generators of speed and images, are (…) less the means of transporting the passengers than of dephasing and desynchronising [them]" (2005, 128). Sight is for me one of the tools that serve to locate the body in space, but it cannot compensate for a limited or contradictory input from other senses. In fact, I experience sight as a way of 'feeling' my immediate surroundings in relation to my moving body – objects are acknowledged as they appear at the edges of my field of vision, often without being looked at directly. Perhaps this is the kind of 'substantial' vision that, Virilio argues, is being replaced by an 'accidental' one – the human gaze becoming immobile and seizing 'instantaneous sections' of reality, like a camera lens (1994, 13). Whether seeing *like* a lens, *through* a lens, or through images, such rigid visual perception has the same effect on our interaction with the world as written language, which as Abram argues, short-circuits the "participation between the human senses and the whole of the sensuous surroundings", and leads to seeing nature "as a passive backdrop against which human unfoldings happen, but (…) not [as] a player in those unfoldings" (Abram 2004).

Figure 3.4. Douglas Huebler, *Duration Piece #5,* 1969. Source: http://chuchoqmp.wordpress.com/2012/10/17/multiples-significados.

‘Landscape’ is an expression of nature seen as such a ‘passive backdrop’. The anthropologist Christopher Tilley has defined it as

> a cultural image, a pictorial way of representing, structuring or symbolising surroundings. (…) Landscapes (…) are images which are created and read, verbal and non-verbal texts. (…) [L]andscape as image has both ideological and ontological implications for the way in which we think about the world. (24-25)

‘Landscape’ is therefore a cultural construct that belongs to what Heidegger calls ‘Enframing’ – the way of revealing that is a ‘challenging’ rather than a ‘bringing-forth’, and that actually *blocks* the latter (1977, 30). In doing so it presents what is unconcealed exclusively as standing-reserve with man as its orderer, and “the impression comes to prevail that everything man encounters exists only insofar as it is his construct. This illusion gives rise in turn to one final delusion: It seems as though man everywhere and always encounters only himself" (1977, 26)[41]. The ordering of nature as 'landscape' prevents any attempts at seeing its more-than-human otherness. In the extreme, as the artist's Joan Fontcuberta's *Landscapes without Memory* series demonstrates (figure 3.5), 'landscape' can be fabricated 'photographically' with no recourse to reality. Although computer-generated, the images look "surprisingly familiar" (Batchen 2005, 9). They inevitably pose the question of how much 'reality' is in photographs that look the way we expect them to look, picturesque or even sublime. As Krauss suggests,

> it is perfectly obvious that through the action of the picturesque the very notion of landscape is constructed as a second term of which the first is representation. Landscape becomes a reduplication of a picture which preceded it. (1986, 163)

Thinking about photographs of nature in metaphors, analogies and stories, or in terms of the sublime is, as James Elkins argues, easier than keeping ones mind on the amount of "senseless detail" they offer (2011, 81)[42]. However, I would

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[41] A similar point was made by Lyotard, who noted that "perspective is, first of all, a principle for the ordering of bodies in space, and (…) that ordering reflected a particular mode of thought that saw human relations in terms of hierarchical structures and relationships of power", including that of man ruling over the land (in Townsend, 75). Landscape is in this sense "a rendering both picturesque and orderly of the sublime aspects of nature" (ibidem).

[42] Elkins devotes the book *What Photography Is* (2011) to analysing photographic marks as essentially meaningless. He purposefully seeks out images not taken from the human perspective to experience the "helplessness in the face of the endless irrelevant details of the world that photography impertinently and obstinately keeps giving me" (72). He perversely looks in them for details that have nothing to do with the 'dramatic sublime' of the subject, or with that which catches his attention like Barthes's *punctum* – for things that are "too intricate, too ordinary", that "fail to reward [him] with a story or a subject that can help [his] eye escape" (86-87). He writes about the 'seeping cessation of meaning' that happens "around the edges of every photograph, on each side of the thing […] at which the camera was putatively pointed" (91). Those elements surrounding the photograph's subject create 'a matrix of unseeable forms', they thrive in the peripheral vision of the person looking at a photograph, and resist interpretation simply because they are boring. Elkins is interested in this boredom, which "is what the camera constantly threatens" on account of its automatism (93). Occasionally, "the utterly unpromising and unrewarding things that dumbly inhabit photographs (…) will start to seethe with meaning", but usually "it is a strain just to keep looking" at them (93), which is the reason why a viewer is often unaware of them, permitting himself not to see, forgetting how to see and refusing to remember to see – that is, not looking consciously and remaining oblivious "to what the photograph continuously insists on presenting to me", while at the same time being convinced of seeing it (94). If fact, however, when photographic marks are not read as meaningful signs, the subjects of photographs are indistinct from their surroundings because photography pictures everything with equal preciseness and eloquence. It offers us 'the world's on-and-on' - a term Elkins borrows from Thomas Weiskel, a theorist of the sublime (*The Romantic Sublime: Studies in the Structure and Psychology of Transcendence*), to describe "the image of this endlessness [which] is the wasteland, a place that continues forever, at least in imagination, and has no features, boundary, or orientation" (81).

argue, the ‘detail’ is only ‘senseless’ when the visual is abstracted from embodied perception.

Figure 3.5. Joan Fontcuberta, *Orogenesis Pollock*, 2002. Source: http://www.eyecurious.com/interview-joan-fontcuberta-landscapes-without-memory/.

Virilio asks:

> What, in fact, is the true tree? The one perceived in a pause, every detail of which can be visually itemized, every branch and leaf; or the one glimpsed flashing past in the stroboscopic unfolding of the car windscreen, or else through the strange skylight of television? (1997, 89)

Neither, I would argue, since both are perceived in isolation from the seeing body and could therefore be considered in the context of the culturally loaded idea of the picturesque. Spending long days walking in the environment that I make the works in, my visual experience is intimately connected with the bodily perception of moving through it. It is neither seen in great detail nor in a blur. Above all, it is not seen as ‘landscape’. Rather than being a ‘passive backdrop’ for my actions, it is “a potentized field of intelligence in which (…) [I] participate” (Abram 1997, 260). If photographic technology frames nature as ‘landscape’[43], then it also, according

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[43] This, arguably, has been the case since the early days of photography. As Geoffrey Batchen writes, “for many (…) pioneers, landscape not only represented the principal

to Heidegger, “conceals that revealing which, in the sense of *poiesis* [bringing-forth], lets what presences come forth into appearance” (1977, 27). As a result, revealing itself appears merely as the regulating and securing of standing-reserve. “The camera (…) is”, Christopher Townsend writes, “a device *produced by* the picturesque (…); its first principle is to manage, measure and regulate light, the very essence of nature” (71-72). By giving up much of the technology of photography designed to realize the Heideggerian Enframing, I therefore explore the possibility of recording place as something existing independently of being looked at and thought about, rather than as a Heideggerian standing-reserve that remains on call to be ordered as part of the human discourse. Bringing only the necessary minimum of technology to the site and laying bare the mechanisms of forming an image by constructing a primitive camera from scratch (figure 3.6) acts against the tendency towards concealment of the process of revealing. Because of the durational nature of light acting on the pigments in the paper over a period of weeks, the limited control over it, and the instability of the obtained image, the method has little to do with regulating and securing that characterize Enframing.

Figure 3.6. Building a camera. Still from the film material documenting the making of *Zeblasjoch, towards Samnaun, Engadin, Switzerland, 2460m a.s.l., 1 – 12 Aug 2013*. Work by the author.

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pictorial aspiration for their latent process but provided much of the conceptual and technical language used to describe its expected products. Whether landscape figured in their discourse as picture, concept, or vocabulary, it invariably fit within the framework provided by the aesthetic theory known as the picturesque” (1999, 69).

Representing place as elemental through the absence of the visual

Nevertheless, despite my choice of techniques aimed at representing place as elemental rather than as ‘landscape’, it might be argued that a place becomes such a cultural construct as soon as it is signified by a work of art. Despite my avoidance of ‘scenic views’ in the choice of locations, remote, mountainous places like the Alps, where my works are made, are laden with associations of a certain sublime grandeur. However, the denial of the ‘scenic’ in the work happens not through the choice of locations but through the lack of the kind of visual representation that the ‘scenic’ is based on and that, similarly to ‘landscape’, is a cultural construct. As the theorist William J.T. Mitchell has written,

> vision is a cultural construction, that is learned and cultivated, not simply given by nature (…) it might have a history related in some yet to be determined way to the history of arts, technologies, media, and social practices of display and spectatorship (…) it is deeply involved with human societies, with the ethics and politics, aesthetics and epistemology of seeing and being seen (166).

Using the photosensitivity of the plant papers themselves that produces at best a very indistinct image might therefore be the most appropriate non-anthropocentric expression of place, an escape from the human perspective, as defined by Elkins (2011). One might even argue that this breaking free of representation is an expression of the sublime understood, as in Jean-Luc Nancy’s writing, as “the dramatic overflow of sense that takes place at the limit of form” (Boetzkes, 109). Indeed, the sublime for Nancy “enacts the suspension of art at the point at which art gives way to something else” (ibidem, 110). It is therefore in the sublime that art overflows the limits of the visible and can “yield a sense of the earth’s excess at the limit of representational form” (ibidem, 110).

Similar concerns are manifest in Robert Smithson’s *Nonsites* – the artist sought to signify place other than through its reduction to what he called ‘perceptual phenomenon’ (Linders, 193). The works typically consist of containers corresponding to a particular sector of an aerial photomap and containing ore or rock from, and proportional in amount to, the area. In *Nonsite, Franklin, New Jersey* (figure 3.7) he “used the shape of the trapezoid to play on no longer useful Renaissance concepts of space” (Hobbs, 14) (that is, the single point perspective). The very title *Nonsites* contains the pun ‘nonsight’, that is, ‘nothing to see’, and clearly declares the works as non-pictorial representations. The artist defined The Nonsite as “a three dimensional logical picture that is *abstract* yet it *represents* an actual site (…). It is by this three dimensional metaphor that one site can represent another site which does not resemble it – thus *The Nonsite”* (Smithson 1996, 364).

Figure 3.7. Robert Smithson, *Nonsite, Franklin, New Jersey*, 1968. Source: http://www.wikipaintings.org/en/robert-smithson/a-nonsite-franklin-new-jersey-1968.

Just as I do not consider my activity as photographing landscape, Smithson did not see himself involved with nature perceived from the human perspective - “there is no anthropomorphic reference to environment” (Smithson 1979, 177). This is reflected in the choice of sites, which is not based on sight, or framing a picturesque view – in the case of my work the general locale is determined by the criteria detailed in the previous chapter, while the choice of a particular spot is random (the scale of the outdoors has to be kept in mind – even a reasonably precise pinpointing of a place, for example where two rivers meet, will include hundreds of rocks, any one of which can be arbitrarily chosen to make the work on; figure 3.8). In Smithson's words, "you have to find a site that is free of scenic meaning. Scenery has too many built-in meanings that relate to stagey isolated views" (Smithson 1979, 186). His interest in time on a geological scale, including times when humans were not around caused him to look for sites that strike "the kind of timeless cord". "The site selection is by chance. There is no wilful choice" (in Lippard, 89). "There's no criteria; just how the matter hits my psyche when I'm scanning it" in a way he calls "low level scanning, almost unconscious" (Smithson 1979, 168). To expose the fundamental difference between the human world and the earth, an artist has to challenge the assumptions (including his or her own) "that a fixed location has a predetermined significance and that it could ever be the basis of an essential identity" (Boetzkes, 11).

Figure 3.8. Building a camera – the precise spot is chosen at random. Still from the film documenting the making of *Fuorcla Sesvenna, towards Rassasspitz, Engadin, Switzerland, 2770m a.s.l., 5 – 20 Aug 2013*. Work by the author.

It is primarily in the lack of clear pictorial representation that my work activates the opposition between, on one hand, a technology that 'reveals' in the sense of Heideggerian 'challenging', that is programmed to output iconicity-prioritizing and culturally codified photographs (of, for example, 'landscapes'), and, on the other hand, a procedure characterized by the 'bringing-forth' type of revealing that results in more ambiguous and trace-like objects that hope to point to something beyond the cultural constructs about what they represent. The latter is still photographic - its aim is not to resist the core qualities of the medium, but rather, as Virilio advocates, to "penetrate the machine, explode it from the inside, dismantle the system to appropriate it" (Virilio and Lotringer 2005, 74). Virilio warns against the machine functioning as an idol, which leads to contemporary art failing to *re*-present and instead only presenting. This, in his view, is because image is replaced by optics corrected by the machines, which work at the speed of light so that everything is experienced live, as it happens, in a negation of *re*presentation understood as reflective, durational, and auratic ("representation has a cult dimension, … presentation has no other value than in the moment. It doesn't seek to endure" [ibidem, 46]). The extremely long exposures required in my work, and the uncertainty of obtaining an image, are the opposite of the Virilian speed of the machine characterized by exposure times shorter than the time our nervous system needs to record ocular perceptions (1994, 61). Although fashioning primitive cameras out of natural found materials might appear comparable to the Virilian 'sightless vision' where the viewpoint is not that of a living subject but of an inanimate object (his example being surveillance cameras [1994]), my conveyance of vision to the land, or the environment, in fact exposes the limitations of the optical code in which the 'vision machines' operate because its results signify in ways other than only through pictorial representation.

As Heidegger has it, "the essence of technology is in a lofty sense ambiguous" (1977, 33). When he poses art as the 'saving power' from the 'irresistibility of ordering' that characterizes technology, this is not to suggest that art can step outside of Enframing, but rather that it "can step back from within it, as a way to face it" (Boetzkes, 105). For this to happen, he advises

> catching sight of what comes to presence in technology, instead of merely staring at the technological. So long as we represent technology as an instrument, we remain held fast in the will to master it. (…) When, however, we ask how the instrumental comes to presence as a kind of causality, then we experience this coming to presence as the destining of revealing (1977, 32).

In a similar way, constructing cameras and making photosensitive materials is to see in the automaticity of the medium the potential to reveal what it is usually programmed to exclude – the elemental as that which "exists outside the human schema of production, consumption, or meaning" (Boetzkes, 102). Marking the elemental as "an absence of, or an obstacle to, coherent sight" (Boetzkes, 19) in a medium that is often seen as almost purely optical and that is (despite being to an extent independent of human intentionality) tightly guarded by its technology to produce intelligible outcomes, asserts the irreducibility of the elemental to human signification. This paradox of using technology to reach the other-than-human is affirmed by Heidegger when he writes: “the coming to presence of technology gives man entry into That which, of himself, he can neither invent nor in any way make” (1977, 31).

The primitive cameras I construct are a partial actualization of what all cameras, according to Van Lier, state quite bluntly despite the perception of photography as an anthropocentric act:

> Put us down somewhere, allow us to release the shutter by ourselves, we will manage to make you something, to produce things often better than you have, which you will never understand absolutely anyhow, as you are concocting mostly anthropomorphic, thus irrelevant theories. And are you even sure you are dealing with representations and graphs? Nothing is more inhuman (indifferent to human plans) than an imprint, no matter how indicial to your eyes, and even though indexed by you. (77)

Van Lier clearly indicates the propensity of photography to record things beyond the human perspective, and therefore also to represent place as elemental. He makes a distinction between *indices* and *indexes* (to which I will return later), with photographs being necessarily *indices* – the effects signalling their natural and technical causes - and only optionally *indexes*, that is, intentionally taken, processed, framed, etc. Leaving a primitive camera on-site to slowly expose an image over the course of days or weeks has a similar result to what the philosopher imagined as putting a camera down somewhere automatically taking shots - such a photograph has no assigned meaning, but rather has the inevitable minimal degree of meaning arise from within, from its impartiality and automaticity empty of human behaviour. Conventionally, photographers ‘release’ their creations to the world after having carefully crafted the printed image. When I leave the camera on-site (figure 3.9), this separation occurs much earlier - not after, but before the photograph is actually exposed. I see it as passing the control over the work to the place where it is left, and which it attempts to represent. My creative involvement ends in this moment and I do not change the work in any way after I retrieve it. Such minimal degree of intentionality, Van Lier has it, “can profoundly affect us”, and “respect[s] the photographic nature of the photograph” the most (104). As ‘light drawings’ (the term ‘photography’ being a compound of the Greek *phos* for ‘light’ and *graphie* for ‘writing’, ‘drawing’ and ‘delineation’), photographs “unveil nature in its most basic aspects” (59), rather than showing it through a prism of an existing language of representation. Non-pictorial photographs draw attention to this ‘naturalness’ of the medium, being merely “the effects of photons having touched this or that” (105).

Figure 3.9. Leaving the camera on-site for the duration of the exposure (in this case 9 days). Still from the film material documenting the making of *Davo Lais, towards Muttler, Engadin, Switzerland, 2660m a.s.l., 3 – 12 Aug 2013*. Work by the author.

The absence of the visual and intrinsic value of interacting with place

The lack of pictorial representation most categorically opposes Heideggerian Enframing by rendering the resulting photographs ‘useless’ as products of technology designed to yield images defined in terms of their function as iconic signs. In the age in which, according to Heidegger, everything is reduced to a resource and is only valued in terms of its use, my non-pictorial photographs point only to the event of their becoming (the making and the exposure) and nothing beyond themselves – they have no instrumental value derived from iconicity. As such, according to the philosopher Moritz Schlick, they are a form of play. Although one might argue that all artworks, and therefore all photographs made by artists, are ‘useless’ in that way, I would nonetheless insist that if such photographs resemble then their iconicity ‘serves’ the internal purpose of the artwork (and therefore the process of making them serves the purpose of producing a likeness)[44]. Similarly to Heidegger, Schlick saw modern life as filled with goal-seeking work, and redeemed through rare moments of play, when one

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[44] That is, an artist would usually use the medium of photography because pictorial representation is required for obtaining the particular result he or she has in mind for the artwork. In this case, the photographic process itself has the purpose of producing a visual likeness, even if the artwork itself is purposeless. The opposite can only be true if photography is used without the purpose of obtaining an image.

does not chase value, but is immersed in it (Rowlands, 88). Whenever something is done for some external purpose, it is, according to Schlick, a form of work - the value of such activity lies entirely in this other thing that it affords. It is only play that has no purpose outside itself – that is useless for anything else – and it is precisely such worthlessness that is, as another philosopher Mark Rowlands argues, “the necessary condition of real value” (Rowlands, 184).

To purposefully make non-pictorial photographs raises questions as to whether they can be called photographs as all, and what is the function of - and the intention behind - such ‘images’. These doubts are justified since, although photographs are indexical through the mode of their becoming, i.e. ‘ontologically’, their ‘epistemic value’ (Freeland, 51) usually lies in their accuracy as representations (it is their usual purpose to be recognizable as icons). Among the functions of my non-pictorial photographs is perhaps to indicate the intrinsic value residing in things: things not done for some external purpose but only for their own sake. Certainly one of those things is the absurdly laborious and time-consuming process of making this work: of hiking to remote locations, making paper there, building a camera, only to repeat the whole journey after a couple of weeks in order to retrieve it. It could be analysed in terms of the philosopher’s Bernard Suits’s definition of ‘game’ as “an activity in which we voluntarily choose an inefficient means of achieving a goal, and we do this just so we can engage in the activity” (Rowlands, 90). My ‘game’ begins with the ‘pre-lusory’ goal of creating a photographic representation of a place. This has nothing to do with making plant paper or building cameras. It can be most efficiently and effectively achieved using a fast camera producing detailed images. But to this goal I bring a ‘lusory attitude’ (from the Latin *ludus*, meaning ‘game’) that says I want to achieve it in a particularly difficult way, and that turns the activity of achieving it into a game. Playing a game is therefore, essentially, making things difficult for ourselves.

Indeed, the pre-lusory goal of a game is secondary to the activity itself – my papermaking, camera-building, etc., is done *not* in order to produce a photograph that would point to something else and therefore function as photographs usually do (in which case it would be wiser to choose a more efficient and reliable way of achieving this). Rather, the value lies in the process of being engaged with the process of making a photograph and with the location in this particular way. This is accompanied by the conviction that the real subject of this endeavour, place as elemental, is un-representable to any satisfactory degree – and that to communicate the experience of interaction with it would perhaps also be to instrumentalize it. If the non-pictorial photographs point to anything beyond themselves, it is to the process of their making and its value lying not in producing a detailed iconic representation of a place but in producing a representation in a way that questions the technology that promotes a purely utilitarian viewpoint. To oppose Heideggerian Enframing is to see value in photography as a process rather than as a result – not as means to preserve, displace, and display visual images, but as (in this case) a way of interacting with place that is in itself intrinsically valuable. Flusser, writing in the 1980s, has recognized the 'lusory attitude' as characteristic of the future society based on the production of information rather than objects. From the current perspective of the widespread use of digital cameras, daily experience of viewing images on screens and transferring information over the internet, it seems perhaps more likely that, instead of a pursuit of "the useless dialogical elaboration of pure information" (1986b, 331), the 'game' of the future will be about physical involvement with materials producing useless objects.[45]

Non-pictorial representation and objects as auratic

Lack of pictorial representation shifts the attention to the artworks' objectness, which acts as a physical connector between the place of their origin and the place

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[45] I do not wish to make a particular distinction between digital and analogue photography in terms of the physicality of the two processes. As outlined in the first chapter, I consider the physical link between the subject of a photograph and its object (for example, the print) to be virtually as strenuous in case of an analogue print as in case of a digital one (the difference lying in the intermediate step of light being registered by silver halide molecules of a negative or by a digital sensor). Critics have long been pointing out that digital photography is no less 'material' than analogue photography (Batchen 2001a, Sassoon 2004). In this sense, photography has been from its conception concerned with the transfer of information rather than production of objects indexical to the referent (that would, due to the very nature of an index, be less effective as carriers of information about the referent). It would therefore appear that, from a historical perspective, photography as a medium is an expression of what Flusser recognized as an evolution towards a society based on the production of information rather than objects. Craig Mod (2013) predicts a complete transition from using cameras to using 'networked devices' such as mobile phones that allow us to capture, edit, share and respond to an image almost immediately. He argues that the information that becomes attached to an image in this process (self-metrics of a photograph like location or weather, and data such as route-tracing, fitness level, social status or state of mind that is pinned to each image through social services) is of greater value in the world of viewing images mainly on small 'networked screens' than the number of pixels offered by stand-alone cameras. Parallel to this evolution in the popular use of photography, however, there can be observed a movement towards greater engagement with materials with a 'lusory attitude', marked by a revival of crafts, and by a growing interest in historic and alternative photographic techniques, where the result is often secondary to the activity of producing it.

of reception. Such an object begins to function like a relic, which in the eyes of a pilgrim is “not the representation but the actual matter of saintly martyrdom” (Crow, 42). While the aesthetics of photography is largely based on opticality as that which could transcend matter and time, creating an impression that, like in Greenberg’s aesthetics, “matter is incorporeal, weightless, and exists only optically like a mirage” (in Roberts, 33), in a relic it is matter that can transcend the visible. To compare a photograph to a relic highlights, moreover, what is usually rashly overlooked – the fragility of the physical link between the photosensitive surface and the referent. “It is not some thing that has touched the film”, Van Lier writes, “but only photons that have touched the thing and the film, thereby only remotely and very abstractly linking both” (19). Not only photons modify the halides of the photosensitive layer in a random way, but there are also optical distortions, unevenly sensitive emulsions, chemical disruptions etc. For this reason, Van Lier sees photographs as “very direct and physical luminous photonic imprints, which are but the very indirect and abstract imprints of objects” (11). Because a photon is not a substance in a proper sense, the indexicality of photography can also be brought into question. Nonetheless, in a relic the invisible and the unverified only add to what Georges Didi-Huberman called ‘the fantasy of referentiality’ (1984) – the desire to ascribe iconic meaning to purely indexical marks the origin of which is a matter of belief rather than of certainty. A relic might be hidden beneath the splendour of its container and surrounded by other sensory stimuli such as sounds and smells. Its main quality is what Walter Benjamin called an aura, which is established by ‘myth’ (Missac, 56) – the knowledge of how an object came into being through direct contact with what it signifies, and the value ascribed to this fact.

An object in an art gallery functions in a similar way to a relic. To use again the term coined by Yuri Lotman, a gallery constitutes a semiosphere that causes viewers to assume the objects within it are valuable, and that the information detailing, for example, how they were made is true. All the elements that make up a semiosphere of a religious context or of a gallery, and therefore designate an object as a relic or as an artwork, necessarily belong to a sphere of meanings that involves issues of belief and culture, and is therefore exclusively human (I analyze this in the next chapter). In case of works such as my non-pictorial photographs this dependence on external information (Peirce’s ‘independent knowledge’ of the production of an index) and conditions of reception becomes particularly prominent. The artist Bruno Jakob’s work explores the tension between the invisible and the status that artworks acquire as objects claiming to have been exposed to certain actions or located in proximity to other objects or beings. He has exposed canvases to rain and sun, to the gaze of other people or to the presence of animals or the environment in order to capture some transferable form of their energy. His actions (and the subject of each piece) are communicated to viewers through titles, lists of materials and photographs of the artist creating the pieces (figure 3.10).

Figure 3.10. Bruno Jakob *Untitled (Horse) Invisible Painting/Energy*, 2003. Source: http://www.lrb.co.uk/v34/n15/brian-dillon/at-the-hayward.

Jakob's works operate based on a conviction that a canvas can capture unseen energies. Similarly, the idea of a photograph as a surface touched by rays of light passing through a lens involves the invisible inducing change in the physical. That the change is made visible through photosensitivity makes the idea of objects as carriers of presence all the more plausible. This is perhaps particularly apparent in those of my works utilizing plant pigments present in the paper (pieces made in 2013, for example figure 3.17), as in this case the object itself, without additional sensitization, is photosensitive if exposed long enough. Jakob's canvases, as well as my plant papers, act as what Amanda Boetzkes calls 'receptive surfaces' "on which elementals appear without being formalized into a pictorial image", and which simultaneously communicate "a distinct stance of recession and openness to the excess of the sense that elementals deliver" (21). Had the surface not been photosensitive, or not sensitive enough, would an image still exist in some form? Most silver-based photographic processes utilize the phenomenon of a latent image, that is, an image exposed far too briefly to be visible straight away, but possible to be made visible through development. It is easy to imagine that the views exposed onto my chemically-sensitized plant papers (works made in 2012, for example figure 3.12) that failed to produce an image could one day be brought out with some new technique, just as energies captured by Jakob's canvases could be visible have we had the right instruments for observing them. As it is, however, the recognition of those works as 'receptive surfaces' for unseen energies or rays of light relies on the 'independent knowledge' about their making that is communicated in the form of necessarily culturally-coded signs such as a textual description or visual documentation (for example, Jakob's photographs and my film, in as far as both show the interaction of the artist with the referent). It requires a suspension of disbelief for viewers to accept what they see as what it is claimed to be.

The fact that Jakob's gestures have been compared to photographic processes (Rugoff 21, 61) shows that photographs are indeed seen as enjoying a special relationship with their subjects based on physical closeness. This, however, as I have argued, strictly speaking applies only to direct positive photographic processes rather than to photographic reproductions. Walter Benjamin's concept of the aura was developed to describe that which is destroyed in the reproduction of images through photography and film. This destruction, according to Benjamin, is indicated by the shift from cult value of art to exhibition value, and from being based on ritual to being based on politics (1968, 224)[46]. While Benjamin himself was critical of the aura[47], my (and many other artists') attraction to the idea of appearance as subservient to material presence of objects is the very opposite. For Smithson, "the idea of shipping back the rocks across the country" had a particular appeal (Smithson 1979, 177). It is also the intention behind many photographs of places to take something (even as apparently immaterial as an image) of a site along, and *dis*place it (travel photography being one example). As opposed to conventional photographs that gain their final shape in postproduction,

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[46] According to Benjamin, the value of the work of art stems from its historic ritualistic cult value, whether it be magical or religious cult, or secularized one – like the cult of beauty (1968, 223-4). Art for art's sake, the theologizing of art, is rejected in favour of artistic production that serves a purpose and stands in direct relation to the political struggles of the time. "By the absolute emphasis on its exhibition value as opposed to an ahistorical cult value, the work of art becomes a creation with entirely new functions, among which the one we are conscious of, the artistic function, later may be recognized as incidental" (1968, 224).

[47] As theoreticians now tend to agree: Missac, 16, 94, 100; Jones, 368.

however, materials exposed directly in-camera function as carriers of presence and they should not only be looked at but also be understood as communicating something beyond the visual. To the extent that my technique is photographic even though it creates a unique object and not countless reproductions, the practice is a reversal of Benjamin's argument.

Non-pictorial representation and materials as auratic

However, it is perhaps the physical composition of a relic rather than any external indicators such as verbal, textual or visual descriptions that most convincingly communicate its aura. In this project, I have moved from making works on a neutral support brought to the site (sensitizing photographically sheets of commercially produced paper; works produced in 2011; figure 3.11) to making plant paper on location (works from 2012 that included chemical sensitization, and from 2013, which utilized the photosensitivity of plant pigments; figure 3.12). This change towards a stronger physical connection between the work and the site has happened at the expense of iconicity of the photographic image, as I have been unable to get the chemical processes to work on the handmade plant paper surface (and plant pigments present in the paper produce only an indistinct image). But by subduing visual representation of a place, its tactile elements such as vegetation, became more pronounced, not only in the appearance of the pieces but also directly in their physical composition, volume, texture and smell. The grass constituting the paper began to signify place by being literally what Peirce described as an index - “a fragment torn away from the object” (CP 2.231).

Figure 3.11. *Hole IX, exposure XIX*. Solothurn, Switzerland 26.11.2011. Hahnemuhle bamboo paper sensitized and exposed in a ‘hole in the ground’ camera. Work by the author.

Figure 3.12. *Tiral, Engadin, Switzerland, 2587m a.s.l., 18 & 20 September 2012.* Plant paper made on-site, sensitized photographically and exposed in a camera built partly from natural found materials. Work by the author.

To this extent, my plant paper works are more immediately recognized as auratic objects than the earlier pieces in which images were exposed onto plain white paper. The materials themselves speak of their origin and their history – the plant paper sheets look dilapidated, crumpled, or even tattered. Viewers have commented on the time dimension that the grass as a material brings to the work, preceding the moment of exposure (Open Studios Day, Nairs, 2013). The papers are like flowers pressed to preserve the moment when they were collected, but also embodying the whole duration of their growth. Moreover, the time element that viewers become aware of also includes the speed of transforming the materials into an artwork – the process of cooking, beating and screening the paper takes a few hours, and the photographic exposure, when the photo-sensitivity of plant substances is used, lasts – depending on the light - weeks or months. The artist George Steinmann believes that by not subsuming materials to our own “culture of time”, works can begin to develop on a “different temporal axis” (171). For his pieces he extracts pigments from mineral springs, rocks, lichens and berries – an act he places in direct opposition to buying industrially produced paints that he is familiar with because of his training. This enormously time-consuming task is a voluntary *deceleration* - in his experience, there are “levels of perception and awareness that we can only tap into beyond the bounds of today’s breathlessly frenetic pace” (171)[48]. The broad associative field of the pigment – the location of the spring or the plant, the geophysical features of the region, its cultural significance, etc. – is incorporated into the work, so that, together with the place where it is shown, “a mental unity results that goes beyond the bounds of space and time” (158) (figure 3.13).

Figure 3.13. George Steinmann *The World and the Mind*, installation view (fragment). Exhibition in Fundaziun Nairs, Engadin, Switzerland, 2012. Pigments extracted from rocks, plants and mineral springs in the region. Photo: Dominique Uldry. Source: www.nairs.ch.

In my work, materials signify in ways that transcend photographic iconicity, or even are subversive in relation to it by creating a heterogeneous rather than a seamless surface on which the tonal variations of the image appear. They act

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[48] His working method is, in his words, a “quest for a measure of time that is compatible with the inner and outer rhythms of nature. I believe it is imperative to let things take their own time. We must not try to mould them to the dictates of our own short-term and mostly economically motivated interests, which are governed by a very different time frame” (Steinmann, 171).

against the tendency to look ‘through’ a photographic surface to see an image. Allowing the materials to show through the finished object is, as Ingold argues, to express “the generative fluxes of the world (…) in which the materials came into being and continue to subsist” (2011, 28). It is therefore also to undermine Heideggerian Enframing as presenting everything from the human perspective and instead to create conditions for a revealing in the sense of ‘bringing-forth’ – letting “what presences come forth into appearance” (1977, 27). Unlike objects as things in which the flux of materials is stifled and stilled, materials can actively “stand forth from the things made of them” (Ingold 2007b). This is the case in the sculptures of David Nash, for example his *Ladder*, in which “the wood appears to body forth from the thing made from it, rather than retreating back-stage as is the case with its factory-made equivalent” (ibidem) (figure 3.14). Insofar as materials can thus be said to have an aura, it is, as Ingold argues, not in the animistic sense of having a spirit residing *in* matter, as something external to it, but in the sense of the spirit being *of* matter. Therefore, objects such as Nash’s *Ladder* or my plant papers “inhabit the border zone not between matter and mind but between substance and medium” (Ingold 2007b). This is perhaps particularly true for those of my works that utilize the photosensitivity of pigments present in grass paper – where not only the physical form but also the image arises directly from the material that constitutes it, therefore challenging the perception of the photographic image as immaterial or somehow independent of its physical support.

Figure 3.14. David Nash, *Ladder*. Wood, 4 metres high, Lake Biwa, Japan. Source: Ingold 2007b.

This difference between “native forms of the earth” and mass-produced artefacts is also evocatively described by David Abram. In engaging with the rhythms of the former, he argues, we “are led into an inexhaustible depth that echoes that of our own flesh” (1997, 64). The latter, on the other hand, “draw our senses into a dance that endlessly reiterates itself *without variation*” (ibidem). Even when they are made out of natural materials, man-made objects often suppress the element of more-than-human otherness in calculable form (ibidem). According to Abram,

> Genuine artistry (…) does not stifle the nonhuman element but, rather, allows whatever is Other in the materials to continue to live and to breathe. [It] does not impose a wholly external form upon some ostensibly ‘inert’ matter, but rather allows the form to emerge from the participation and reciprocity between the artist and his materials (…). Thus understood, art is really a cooperative endeavour, a work of co-creation in which the dynamism and power of earth-born materials is honoured and respected. In return for this respect, these materials contribute their *more-than-human* resonances to human culture. (1997, 278, emphasis mine)

In this respect, working by feel rather than employing a rigid procedure in the making of my pieces has the effect of allowing the plant substance to remain alive beneath the form of the sheet. Grass in not cooked and beaten long enough to form a homogenous mass, but instead individual fibres remain visible and form their own patterns as the sheet is screened and dried. They constitute an uncontrolled, accidental element that co-creates the photographic image. They also disclose the nature of paper as a mat of entangled fibres in a similar way that the juxtaposition of the refined steel and paint of the containers with the rawness of ore in Smithson's *Nonsites* expresses the artist's interest in "a return to the origins of material, sort of dematerialization of refined matter" (in Lippard, 87).

Non-pictorial representation and surface as opaque

Lack of photographic illusion of depth renders the surface of the works opaque in the sense of resisting the penetrating look characteristic of photographs as 'transparent pictures' (Walton 1984). This opacity is perhaps particularly suitable for representing the elementals as eluding unambiguous pictorial representation. As the philosopher John Sallis argues, elementals such as earth or sky themselves are opaque in the sense of registering in our perceptual field yet resisting our understanding – they "retain a certain indetermination; [they have] no form that would contain [them]" (1998, 157). He quotes Emmanuel Levinas describing elemental as "an opaque density without origin, (…) the indefinite" (1998, 158)[49]. By coming into contact with natural world and simultaneously refusing to unify it into pictorial representation, an artwork becomes "a medium on which the earth manifests and asserts its irreducibility to human signification" (Boetzkes, 21), at the same time "expos[ing] the limits of the perceptual field" (Boetzkes, 107). In the immediacy of their physical relation to the referent my pieces share some characteristics with works utilizing direct print techniques, such as the artist's Helen Mirra's *gehend (Field Recordings 1-3).* 'Recording' her 30-day walks around Bonn, Berlin and Zürich, every hour she took a print from a found object she covered with ink and pressed onto a piece of linen, which she has later

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[49] Amanda Boetzkes also writes: "Because they manifest as gigantic expanses without proportionality or form, Sallis argues, elementals such as sky, air, light, sea and earth are opaque. (…) Though they are not bound objects elementals are nevertheless sensible. They present themselves in the perceptual field – they can be seen, touched, smelled, and tasted – but they inevitably engulf and exceed it. We respond to and interact with elementals, but they register through a different mode of contact" (102).

sewn together (figure 3.15). Her prints are also opaque surfaces in the sense of being “facts without much information, dependent on physical contact” (Mirra 2011). Mirra said: “I’m not mapping in any way, that’s the thing about the scale being 1:1. I stepped in” (2011).

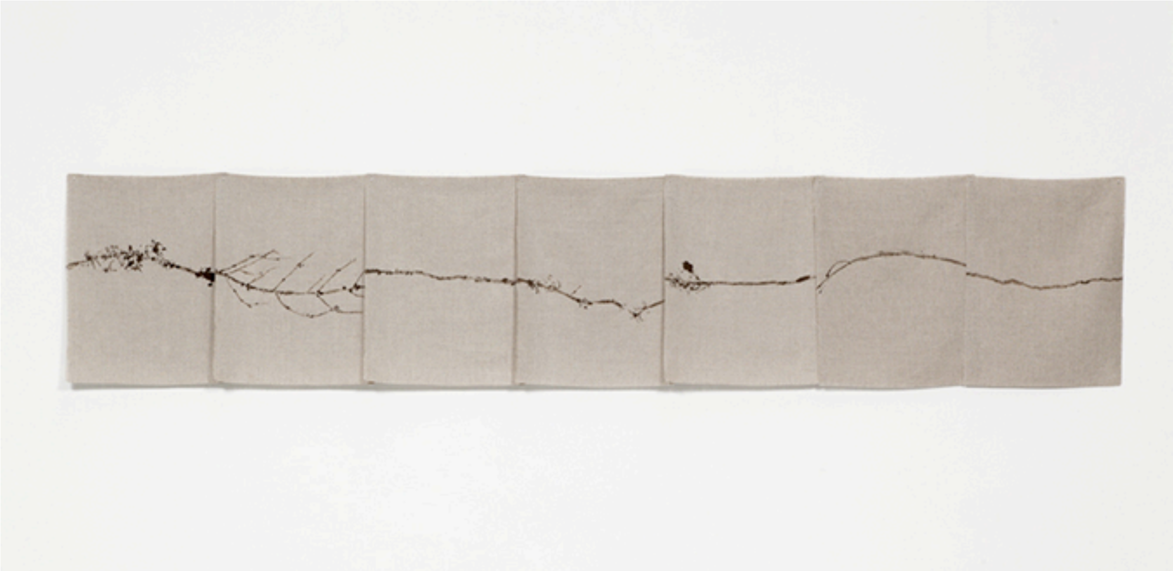

Figure 3.15. Helen Mirra, *Field Recordings, 7x eine Stunde, außerhalb Zürichs (Hinterrhein), 27 Juni* 2010, ink on linen. 33 x 162 cm. Source: www.meyer-riegger.de.

The purpose of Mirra’s works is not to give viewers the possibility to recapitulate her walks (e-flux.com), similarly as it is not the aim of my pieces to provide a detailed visual rendering of a location. Both projects are characterized by a determination to produce work in the closest possible manner to the actual experience of place, or of walking, and the works act as direct imprints of this experience, rather than being made from the perspective of an artist’s studio. The opacity of the works’ surface passes this immediacy on the part of the artist onto that of the viewers. The latter are faced with the material and temporal presence of the object (and through it, that of the referent), but denied the abundance of visual data that would grant them a certain overview of, or distance to, the subject at hand. Mirra has observed that her works “tell you a certain thing about the place, but a lot is left out, very unlike a photograph, where a lot is left out but there is a kind of assumption with pictorial representation that most of the information is there” (Davies-Crook). Although distance, as Merleau-Ponty has noted, is the property of vision: “to see is to have at a distance” (1964b, 166), it is not abstracted from ones own relative position in space. As my experience tells me, sight is one of the tools in the sensorium that serve to locate the body in its surroundings. In the words of Merleau-Ponty,

> one perceives objects, not just as located in space, but as located in space around one. … perception is egocentric. … By presenting them with the things located around them in space, perception thereby presents the subject as located in space with respect to the things they perceive (1964b, 87).

Photographs collapse not only the spatial dimension of perception, which Merleau-Ponty has characterized as the ‘I can’ of sight: “Everything I see is in principle within my reach, at least within reach of my sight, marked on the map of the ‘I can’” (in Virilio 1994, 7). In their instantaneity they also collapse the temporal dimension of looking. The painter Auguste Rodin insisted that a painting can be more true to the way we perceive through tiny rapid eye movements because it can condense several consecutive movements of the subject and, guiding the gaze from one part to another, represent an unfolding of a gesture over several seconds (Virilio 1994, 2). The illusion of depth and the time-freeze effect of photographs appear to replace the perception of the object existing in ones own space and time with an imaginary impression of finding oneself in the scene depicted.[50]

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[50] It is perhaps worth mentioning another painter - Paul Cézanne - who, according to Maurice Merleau-Ponty, strived to “make *visible* how the world *touches* us” (1964a, 19). “It is not enough for a painter like Cézanne, (…) to create and express an idea”, the philosopher wrote; “they must also awaken the experiences which will make their idea take root in the consciousness of others” (19). “His landscapes have lost almost every trace of visuality”, the philosopher Robert G. Collingwood has in turn noted. “Trees never looked like that; that is how they feel to a man who encounters them with his eyes shut” (144). Nonetheless, the novelist D.H. Lawrence explained, Cézanne “*wanted* true-to-life representation. Only he wanted it *more* true to life. And once you have got photography, it is a very difficult thing to get representation *more* true to life: which it has to be” (in Yglesias, 98). Perhaps to use photography, the apparently ultimate medium of producing true-to-life representation, but to reject its ability to resemble pictorially – the base of its claims to accuracy – is also to strive for a representation that is *more* true to life. It is certainly to recognize the culturally determined language of photographic representation, and to attempt to reach beyond it. The methodology developed through practical and theoretical research in this project - building cameras, making paper, using natural plant pigments as the photosensitive substance - might be taken as endeavouring to undo the effects of the world saturated with images, to produce photographs as if photography has not yet been invented. Cézanne, Merleau-Ponty wrote further, “is not satisfied to be a cultured animal but assimilates the culture down to its very foundations and gives it a new structure: he speaks as the first man spoke and paints as if no one had ever painted before” (18-19). His experience of the surrounding world that his work conveys, perhaps in some ways similarly to my photographs made entirely out of the represented places, was that of the literate and technological modes of reflection being rooted in and sustained by the larger, more-than-human field. “’The landscape thinks itself in me,’ he would say, ‘and I am its consciousness’“ (ibidem, 17). His paintings have the effect - to which my work also aspires - of “summon[ing] one away from the already constituted reason in which

It is in this respect that the opaqueness of my works' surface with its abstract tonal varieties can be placed in strict opposition to the 'transparency' of photographic representation. Their 'flatness' as pictorial representations paradoxically heightens their presence in viewers' space and time because it does not allow them to forget they are looking at a physical object. Compare, for example, the earlier works from this project executed on commercial fine art white papers sensitized chemically to render a direct positive photographic image when exposed in a 'hole in the ground' camera (figure 3.16), with the later grass paper works that utilize only the inherent photosensitivity of plant substances (figure 3.17). While the former display an abundance of non-iconic marks on - and in – the surface of the paper (brush marks, holes, etc.) that distract from a realistic illusion of depth characteristic of conventional photographs the surface of which is undisturbed, they nonetheless show a detailed photographic representation – in this case of a rock face - that the latter works are entirely lacking. This lack of detail is, according to Rodin, closer to how human vision functions. Moreover, the durational and accumulative character of the grass paper pieces becomes apparent in the lines burned out in many of the photographs by the sun falling directly into the lens. Viewers might therefore sense the image as having arisen in dialogue rather than independently of the physical form of the pieces – having been 'revealed' in the paper by the sunlight acting on photosensitive substances present in the material of the paper itself over the course of a weeks-long exposure[51]. Both the physical and the temporal element of the photographs are

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'cultured men' are content to shut themselves, toward a reason which contains its own origins" (ibidem, 19).

[51] An unexpected parallel might be found between those works and what Philip Rawson characterized as the 'space as limit' (as opposed to the 'space as environment') type of drawing (1987, 201; a distinction taken from the art historian Henri Focillon, and brought to my attention by Chris Dorsett [2013]). The application of this distinction to photography as an essentially mechanical mode of representation has some obvious limitations, since Rowson's analysis pertains to drawing as a manual process – the order of delineating shapes and the resulting composition are central to his analysis. Nonetheless it sheds some light on the reception of conventional photographs representing pictorially, and those with 'opaque' surfaces. Although we *know* that photographs always depict a fragment of reality and therefore fit into the category of 'space as environment' (characterized by the effect of the represented scene being essentially able to continue beyond the confines of the artwork), such nearly-abstract photographic images as appear in the grass paper works have much in common with the 'space as limit' mode of representation. The most remarkable element of the latter in this context is that it often begins with (or arises from) the artwork's physical form itself (Rawson, 221), subdividing it into distinct areas much like those formed by the light and dark parts of my grass paper works (i.e. the outline of a mountain separates the space above from that below the horizon). This 'unfolding' of representation can be

‘opaque’ to vision, and hence asserting their independence of the human perspective. Not, as Virilio has it, *either* “by presenting itself in terms of some kind of paper or celluloid support surface” *or* by exposure times shorter than the “the limited depth of time of our physiological “take’” (1994, 61), but by being characterized by the opposite of *both*: a non-uniform surface and exposure times far too long to be compatible with human vision.

Figure 3.16. *Hole I, exposure II*. Solothurn, Switzerland 26.11.2011. Hahnemuhle bamboo paper sensitized and exposed in a ‘hole in the ground’ camera. Work by the author.

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decoded by the viewer, unlike in the case of other media such as painting (and, by analogy, conventional photographs).

Figure 3.17. *Val d'Urezzas, towards Jamspitz, Engadin, Switzerland, 2150m a.s.l., 25 Jun – 1 Jul 2013*. Plant paper made on-site and exposed for 6 days in a camera built partly from natural found materials. Work by the author.

Chapter conclusion

In this chapter I proposed that photography is a suitable medium for representing place as elemental, that is, existing outside the sphere of meanings that are entirely human. This is because, as I have shown in the first chapter, indexicality of photographs (their status as physical traces of contact) is their only necessary defining feature, with their quality of pictorial representation being merely optional. Although photographic technology and apparatus are designed to yield predictable outcomes representing the world from the human perspective (and hence photography was celebrated by Benjamin as “set[ing] the scene for the salutary estrangement between man and his surroundings” [1997, 251]), the element of intentionality present in the medium can nonetheless be subverted. As a process taking place essentially independently of human intervention, photography has the potential to capture something of the more-than-human aspect of the sensuous surroundings. This, however, only when photographs are allowed to function as indices - physical traces of their referents – rather than as their visual representations. On account of the particular method of making paper and exposing it photographically in cameras built on-site, the land acts in my work as the referent, the material and the apparatus. This gesture of giving vision to inanimate earth, and doing so in a deliberately slow and labour-intensive manner, can be read as political insofar as it exposes the limitations of the optical code imposed by the Virilian speed of the machine and leading to the Heideggerian Enframing (seeing the world exclusively from a human perspective and as a resource).

The relationship between the photograph and the site of its origin is manifested in my pieces through their presence as objects, and through the materials constituting them. Their surfaces indicate that the places they represent resist being subsumed into an image by appearing opaque rather than ‘transparent’ to the gaze through the illusion of depth created by pictorial representation. The photographs themselves manifest some of the characteristics of the elemental that they attempt to represent – as Amanda Boetzkes writes, “neither image nor object, neither material nor immaterial, and existing in a state between surface and depth, elementals resist the perceptual intention to conceive of the earth environment as a set of things or as a closed system” (102). What is more, the photographs reveal the unintelligibility of both elementals and pure indices, and the reliance of the latter on external information (Peirce’s ‘independent knowledge’) that is necessarily culturally-coded. This is analyzed in the next chapter that discusses the issues around reception of my work, and the process of meaning-making in relation to photographic indices more generally.

Chapter IV. Experiencing photographs as material indices

This chapter completes, in some ways, a full circle by returning to the issues of reception of photographic indices signalled in the first chapter. It traces the evolution of decisions regarding installation of works throughout the project, discussing and evaluating them. When photographs do not represent as images, the process of meaning-making differs markedly from the recognition of a subject of pictorial representation. It relies on external indicators of the indexical and photographic character of the pieces, and on an active participation of viewers' imaginations in completing the act of representation. Although as objects, the pieces elicit an embodied, subjective response involving visual, tactile and olfactory impressions, the meaning of the work does not depend entirely on its viewers. Other elements of the installation that surround the objects – and which need to be included in the definition of the work – signify by convention. Hence, the following decisions are of particular importance: horizontal or vertical positioning of the pieces, the kind of boxes they are placed in, the kind of support such as tables or shelves, the characteristics of the space where they are encountered, the level of interaction asked of the viewers, and the inclusion or exclusion, and editing, of the film showing my interaction with the environment in the process of making the photographs. All these elements need to be composed carefully so that the genesis of the objects, and with it the implications of producing photographs in this particular way, are gradually revealed to the viewers as they experience the work. Upon the initial encounter the objects remain unintelligible as signs. Like all indices, they draw attention to their causes, but their relationship to the referent needs to be recognized by inference. Both the initial sensuous apprehension marked by a feeling of the unavailability of the referent (the impossibility of interpreting the objects in a conventionalised manner) and the subsequent conceptual understanding of the photographic nature of the objects are crucial to experiencing, on one hand, the process of meaning-making in response to an index, and, on the other, the elemental nature of the represented places. Elementality, as proposed by Sallis (2012, 147), is a philosophy of the sensible that is not reduced to it - rather, the elemental manifests in an act of imagining that arises from a combination of the sensuous and the intelligible.

Imagining and embodied perception

Just as vision is not separate from other senses, representations are not disembodied from the worlds they represent. “There is not in a normal subject a tactile experience and also a visual one, but an integrated experience to which it is impossible to gauge the contribution of each one”, Merleau-Ponty has written (1962, 138). Moreover, each of the senses informs us of more than just those properties that strictly correspond to it – they are ‘exchangers’, as the philosopher Michel Serres refers to them (ArtReview, 171). For example, we see what J.J. de Lucio-Meyer called ‘visual texture’ (17) - the softness of fabric, the hardness of steel, etc. – that is, how they feel to the touch. The senses are not discrete modes of experiencing the world but integrated with, and transforming, one another. This is how, in a museum or gallery context, such properties of objects as texture, weight, volume etc. are experienced, despite purely visual apprehension. Chus Martinez ascribes to art the role to “register our potential relations with the empirical world (…) in a time when data has replaced sensory pleasure” (ArtReview, 171). “Art performs the logic of the senses”, she says, “a logic that can never be reduced to touch, sight, smell, or hearing, since every sense is compound” (ibidem). Accordingly, Collingwood concluded that “a work of art proper is a total activity which the person enjoying it apprehends, or is conscious of, by the use of his imagination” (151). The fullest possible engagement between artist and audience - what he called a total imaginative experience - happens where materiality is used in ways urging full affective response. For this to happen, the seer’s whole body must be engaged.

Imagination plays a crucial role in the reception of my work: it has to do not only with venturing guesses as to what the unclear photographic image depicts, but also how the exposed plant paper is made, how it relates to the place it represents, and how the place itself looks and feels like. In representing place as elemental the work establishes a special relationship with imagination, which “gathers and holds together the spatio-temporal dynamics of the elementals, opening spaces (…) for the self-showing of things” (Sholtz). As Sallis asserts,

> the most remarkable things that can be called forth by force of imagination are not in truth things at all but rather elementa, elemental nature in the sense akin to that which oriented early Greek thought. This sense is akin to that which comes into play, even still, when one speaks of being exposed to the elements (2012, 1).

Imagining the elemental is based in my work on the perception of the photographic object as well as on its title, textual description, context of reception and on the film[52] showing my interaction with the environment in the process of its making. Through imagining, viewers themselves are creating that which is represented – the referent is not fixed and the process of representation does not finish with the making of the material object – rather, it only truly begins with showing the object and inviting viewers to complete the process of meaning-making through the active participation of their imaginations. The lack of pictorial representation in my works underlines that which, according to Stanley Fish, is true of all works of art - the responsibility for their meaning lies with the viewers (467; this is not unlike Peirce's notion of the *interpretant*, mentioned in the first chapter). In Fish's view, a work is a set of instructions for executing interpretative strategies, for hazarding meaning, while also, in itself, being on the verge of meaninglessness. He proposes that the impression that meaning is fixed by the intentions of the artist and the interpretation of a community is false – viewers 'invent' the artist by ascribing authority to their actions. The film showing the making of my photographs particularly heightens viewers' sense of my authorial presence, and has the effect of metaphorically transporting them into the depicted scene. The illusory nature of this impression, however, is underlined by the film signifying only indirectly (iconically) a process that is physically evidenced by its indexical traces – the photographs – that nonetheless themselves, by their refusal to represent pictorially, signal the futility of subsuming the experience of place into an image (figure 4.1).

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[52] I refer in this chapter both to the film in its final form (one film for the whole body of works), where I use the singular, and to the earlier versions of the films (one for each photograph), where I use the plural.

Figure 4.1. *Lai Blau, towards Piz Fliana*, *Engadin, Switzerland, 2660m a.s.l., 14 – 27 Jul 2013.* Plant paper made on-site and exposed for 11 days in a camera built partly from natural found materials. Work by the author.

The photographic objects activate the kind of imagining that is very different from the illusion of depth created by pictorial representation (present in my work in the film). An image not only always refers to the past, to the time of its making but also, by defining the represented place as determinate, it cuts viewers off from “the spontaneous life of [their] sensing bodies” (Abram 1997, 56). The experience of an object, on the other hand, is one of reciprocal encounter happening fully in the present moment. By combining the photographic objects with the film, the work highlights this opposition and challenges the separation between activity of making artworks and passivity of their reception. My participation in the flux of materials is matched by viewers’ perception of each object as imaginative in the sense of being “generative of a world that is continually coming into being with and around the perceiver, in and through his or her own practices of movement” (Ingold 2012, 7). The film gives viewers a sense of my relation to the place being represented as not that of an observer but of a participant (figure 4.2), therefore pointing to their own active role in the reception of the work. As I make each work in a remote location, I move around, perceive it not only visually but with all my senses, and by interacting with the materials constituting it (vegetation, earth, rocks) I change it.

As Tim Ingold writes after Merleau-Ponty, my experience is "not of things in the world, but of things becoming things, and of the world becoming the world" (Ingold 2011, 69; Merleau-Ponty 1964b, 181). I see my role as an artist as "making visible rather than reproducing the visible" (Ingold 2012, 6). By proposing a continuity between imagination and shaping the material world, the work questions the ontological division between reality and its representation (Ingold 2012, 15).

Figure 4.2. Building a camera. Still from the film material documenting the making of *Lai Blau, towards Piz Fliana*, *Engadin, Switzerland, 2660m a.s.l., 14 – 27 Jul 2013.* Notice the light areas in the middle of the produced piece (figure 4.1) representing the snowfields in front of the camera visible in this film still. Work by the author.

The artist Mel Bochner has written:

> The root word 'image' need not be used only to mean representation (in the sense of one thing referring to something other than itself). (…) Imagining (as opposed to imaging) is not a pictorial preoccupation. Imagination is a projection, the exteriorizing of ideas about the nature of things seen. It reproduces that which is initially without product (in Lippard 1973, xv).

By eschewing pictorial representation in favour of a multi-sensory response the photographic objects invite viewers to imagine the place and therefore to participate in its self-making. In combination with the film, they reveal the difference between the kind of imagining that takes place in response to an image, which Ingold describes as "conjur[ing] up images of a reality 'out there', whether virtual or actual, true or false" (2012, 3), and the one in response to an object - a "participat[ion] from within through perception and action, in the very becoming of things" (ibidem). The latter is firmly rooted in sensorial perception of an embodied perceiver. The plant paper photographs can represent a place because they activate different modalities of sensory experience (tactile, olfactory, visual) that are interconnected and inseparable (Ingold 2000). The film, on the other hand, and images more generally, rely on imagination or memory supplying the sense impression relating to another sense than the one that is stimulated (as might be the case when viewers watch a scene filmed on a cold and windswept mountainside and imagine or remember feeling at the mercy of the elements themselves; figure 4.3). Peirce has written about icons that, by resembling their referents, they "excite analogous sensations in the mind" (CP 2.299)[53].

Figure 4.3. Cooking plant material for making paper. Still from the film material documenting the making of *Val Plavna, towards Piz Stabelchod, Engadin, Switzerland, 1940m a.s.l., 9 – 17 Jun 2013.* Work by the author.

Exhibiting works from different stages of this project, throughout its duration, both in Switzerland (where they were produced) and in Britain made it clear that the knowledge held by the viewers, and the associations they bring to the reception of the pieces, markedly change how the latter are perceived and understood. The represented places can be primarily identified through textual information in the titles rather than through pictorial representation (the film in its final form showing a variety of scenes from the making of different pieces, rather than, as the earlier versions, documenting the making of each one). Therefore, the

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[53] Neurological research of synaesthesia confirms the intertwining of the senses that shapes the perception of objects by suggesting that synaesthetic experience results from cross-activation between different brain regions rather than being based on imagination or memory (Ramachandran 2001).

reception of the work by those people who know the locations, or at least know how a valley or a mountain in this particular region is likely to look like, is more strongly influenced by their associations based on personal memory or individual knowledge. Consequently, a hint of a valley shape created by the tonal difference in one of my pieces (for example, figure 3.17 or 4.23), combined with the location name specified in the title, might cause them to engage with the work by remembering or imagining in great detail their own bodily participation in the particular place. People who do not hold this knowledge, on the other hand, might engage with the objects on a more abstract level, relying on their material qualities to imagine the place they represent, and refer to the film for a sense of how the environment in the region looks like. The former would often find the work more accessible and easier to relate to, and to this extent the work might be seen as site-specific with regards to its reception (figure 4.4). However, these two are better thought of as different modes of viewers' participation in the process of representing a place, and hence of making the work.

Figure 4.4. Open Studios Day, Nairs, 23 June 2013. The work shown in the box (*Val Plavna, towards Piz Stabelchod, Engadin, Switzerland, 1940m a.s.l., 9 – 17 Jun 2013*) has been made in the preceding weeks in the surrounding mountains. Work by the author.

As a non-pictorial photograph made on-site out of found natural materials, each piece constitutes a link between the site of its making and the site of reception that is activated through viewers' imaginative participation. At the same time, however, it discloses the earth as, in Husserl's words, "manifest[ing] as an infinitely spreading and omnipresent ground for the body and posit[ing] *an enigma to the* *imagination*" (in Boetzkes, 15, emphasis mine). It is a situation similar to Smithson's *Nonsites* – his interest was in the relationship between gallery and outside spaces, in the gap between the scale of the two, and in the resulting confrontation of the viewer with the absence of the site (in Lippard, 88)[54]. My photographs without an image similarly expose the unavailability of the site and the irretrievability of the time of its making. Moreover, another unbridgeable gap becomes apparent in my work in the varying temporal scales of the long process of making each photograph and of viewers' experience of the piece that might last a couple of minutes at the most. The early films, each of which documented the making of one photograph, might have appeared to negate to a certain extent both of these discrepancies by creating an impression of the audience actually witnessing the event. But, each being edited to 7:50 min, they in fact created a third, intermediate temporal dimension in which the work was experienced. The film in its final form similarly creates its own temporal dimension, especially that, in comparison with the earlier films, it does not follow the chronology (and therefore the narrative) of the process of making a particular photograph. Moreover, by showing the events of producing the photographs more indirectly than the earlier films (through scenes shot from a distance, those where my actions are less obvious, through non-chronological editing, etc.), the final film opens another (semiotic) gap – the causal relationship between the photographic objects and the interaction of myself with the environment seen in the film is more ambiguous. It is therefore in the combination of objects and film that the earth manifests in my work its resistance to being either fully imagined or represented visually - "it appears as a temporal or sensorial excess at the limit of representational form" (Boetzkes, 12).

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[54] He referred to the relationship between gallery and outside spaces as that of centre and fringes (Smithson 1979, 176). He said: "most sculptors think just about the object, but for me there is no focus on one object so it is the back-and-forth thing" (ibidem, 161). Neither the site nor the non-site can be really 'grasped'. "The piece is there in the museum, abstract, and it's there to look at, but you are thrown off it (…) spun to the fringes of the site" (ibidem, 162).

Figure 4.5. *Val Plavna, towards Piz Stabelchod, Engadin, Switzerland, 1940m a.s.l., 9 – 17 Jun 2013.* Plant paper made on-site and exposed for 8 days in a camera built partly from natural found materials. As seen at the Open Studios Day, Nairs, 23 June 2013 (figure 4.4). Work by the author.

The parallel disappearance that happened in the original location in case of *Nonsites* - “a place where the piece should be but isn’t. [It is now] somewhere else, usually in a room” (Smithson 1979, 177) – does not occur in my work in the same way because once the photographic process is over there is no focal point, nothing to differentiate the chosen site from its surroundings (not even an absence of material as in *Nonsites* since the grass grows back). Papermaking, camera building and exposure have defined the place (or even ‘made’ it a place), singled it out of the continuity of space for the time of making the work. The subsequent indeterminacy of the site discloses the failure of indices (the non-pictorial photographs) to designate the referent. This appears to me, however, to be partly a consequence of the latter itself being elemental (“an element retains a certain indetermination”, Sallis 1998, 157). This might account for the film – a predominantly iconic sign that by definition always involves an element of cultural convention – similarly failing to designate the spot a work was made in with any accuracy. The early films in particular might have given an impression of determining a place by clearly showing the process of making a photograph, but actually even with the films, because of the scale of the outdoors, it is nearly impossible to identify the location, unless someone is exceptionally familiar with the area. In fact, the latter would only confirm that place is constituted through ones participation in it – either physically, through my making of the photographs, through remembering ones own involvement with it, or imaginatively, through viewers' engagement with the pieces. The place is only truly indicated by entirely conventional signs (what Peirce classified as symbols) - in *Nonsites* through a map or an aerial photograph, and in my work through the title containing the name of the valley, pass or lake, and the altitude (which could help to pinpoint the site if one was to work with a map). These signs, however, define a place entirely from a human perspective, while it is by *not* being able to identify the exact locations, *not* attaching meaning to them based on the experience of the photographs that the latter seem to succeed in designating a place as elemental[55]. As a result, in my work, as in the *Nonsites*, there is "nothing to grasp onto [in a site and] (…) no way of focusing on a particular place. One might even say that the place has absconded or been lost" (Smithson 1979, 176).

Pictorial representation and embodied perception

It appears, as discussed in the previous chapter, that the illusion of depth created by pictorial representation distracts from an embodied perception of a photograph as an object. However, some theories of perception would seem to provide evidence to the contrary. As Ingold points out, the eye of an observer would only mistake a percept for an image or vice versa in an artificial situation when he or she is unable to shift perspective while scrutinising the subject, that is, move about and see it in three dimensions (2012, 5). Perception relies on movement and on proprioception (what the neurophilosopher Andy Clark defines as "the inner sense that tells you how your body is located in space" [1997, 22]). This resonates with my personal observation made while walking, described in the previous chapters, of sight being only one of the tools (on a par with and inseparable from other senses) of locating the body in space. Merleau-Ponty has also noted that

> when I walk around my flat, the various aspects in which it presents itself to me could not possibly appear as views of one and the same thing if I did not know that each of them represents the flat seen from one spot or another, and if I were unaware of my movements, and of my body as retaining its identity through the stages of those movements (1962, 235).

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[55] This point is confirmed by Elkins (2011, 74). It is not to negate the earlier observation about the difference in reception of the works between people familiar with the region and those who do not know it. While previously I have referred to the general form of the land such as the steepness of the valley sides or the shape of the mountains in the area, here I mean familiarity with precise spots of making the works.

As the psychologist James Gibson argues, “the visual perception is the achievement of the whole organism as it moves around in its environment” (in Ingold 2012, 3).

It therefore seems to be a mistake to assess the appreciation of artworks based solely on vision, as the team of cognitive scientists Saunderson, Cruickshank and McSorley did in their investigation of whether originals and replicas are perceived in different ways by measuring eye movements of people looking at paintings and their reproductions (2010). Perhaps not surprisingly, the results indicated little difference in apprehension of originals and replicas, although participants commented on the variations in the material qualities of the images (painting, its photographic reproduction, and reproduction on a monitor) influencing their experience of looking at the artwork. While by choosing the eye tracking method the researchers seem to have attempted to measure only the perception of an *image*, this (as participants’ comments have shown) can never be entirely detached from the perception of its material basis – that is, from its apprehension as an *object*. Even placing participants in a fixed sitting position, without the ability to see that which they were asked to assess from any other point of view, did not hinder their capacity to perceive it as a three dimensional object.

A similar mistaken expectation for the visual to exist independently of, and compensate for, other senses appears to me to take place in works such as Abelardo Morell’s digital photographs taken in a camera obscura-type of tent that projects an image of the view outside onto the ground inside (figure 4.6). The result is an amalgamation of the surface texture of the ground with the illusion of depth created by the projected view. I would argue, however, that any effect of the surface texture rising above, so to speak, the picture plane (the view being that which is immediately identified as a photographic representation) and entering the sphere of the object (and therefore that of its viewers) is spoilt by the fact that both clearly belong to the image. Viewers remain conscious of the physical dimension of the photograph enough not to confuse a surface texture depicted in an image with the surface of the photographic object itself. To fully convey the physical properties of the ground of the place where a photograph was taken it appears necessary to bring to the viewers the material surface itself rather than its depiction. This is the aim of the grass paper photographs made in this project (figure 4.7) – the grass paper is readily perceived as an object and, as viewers have commented, its material is associated with the ‘skin’ of the land. Moreover, the mark burned into the paper by the sun falling into the lens clearly brings the pictorial surface into the realm of the physical.

Figure 4.6. Abelardo Morell, *Tent-Camera Image On Ground: Colorado River Looking Northwest. Moab, Utah, 2011*. Source: aberaldomorell.com.

Figure 4.7. *Val Sesvenna, towards Piz d'Immez, Engadin, Switzerland, 2530m a.s.l., 24 Jul – 6 Aug 2013.* Plant paper made on-site and exposed for 12 days in a camera built partly from natural found materials. Work by the author.

Even though, as the experiment discussed above suggests, we seem capable of perceiving spatial dimensions from a fixed perspective, it appears that spatial, embodied perception of artworks increases when viewers are able to move around them. On the other hand, the realistic illusion of depth offered by photographs, as well as the usual inconspicuousness of their support (such as the flatness and smoothness of paper), encourage a single point of view – an image looks 'correct' when viewers adapt the position that the camera was apparently at in relation to the scene depicted[56]. This effect is even stronger in case of moving image when viewers 'imagine' themselves into the represented reality and their sense of presence in space diminishes. The difference between a film shown on a monitor (such as in case of the early exhibitions in this project) and its projection (as in the finalized installation of the work) also needs to be noted: a screen gives the filmic image a presence in space, while a projection is an image seemingly abstracted from any material base and existing only in the form of light cast over a surface.

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[56] As Christopher Townsend argues, "photography naturalizes single point perspective; it builds into its system of spontaneous depiction what is, in fact, a coded, mediated form of representation" (68).

Although we always simultaneously see both image and object, those two modes of viewing appear as markedly distinct, or even irreconcilable when, for example, a film is shown next to an object, as was the case in some of the early exhibitions in this project. However, they can be balanced in a single artwork to different effects. For example, the artist Fiona Crisp's *Negative Capability: The Stourhead Cycle* show (2012, figure 4.8) consisted of photographs mounted on scaffolding poles in the middle of the gallery space rather than on the walls, forcing viewers to always acknowledge the physicality of the works at the same time as engaging with the photographic illusion of depth of the images. While the latter 'removed' viewers from the space, the constant presence in their field of vision of the reverse of other works positioned in the gallery at different angles firmly forced them back into an embodied relationship with the space and encouraged them to constantly shift their perspective by moving around it.

Figure 4.8. Fiona Crisp, *Negative Capability: The Stourhead Cycle*, Matt's Gallery, London, 2012. Installation view. Source: www.mattsgallery.org.

Verticality, horizontality and embodied perception

Perhaps the most obvious strategy employed from the early stages of this project to challenge the static viewing and to draw attention to the objectness of photographs is their horizontal positioning (figure 4.9). This is in strict opposition to the illusion of depth of an image characteristic of the film shown as a (vertical) projection or, in earlier exhibitions, on a monitor. Horizontality has important implications for representing the elemental as that which in Heideggerian sense withholds from being known, as opposed to something that can be apprehended entirely from the human perspective and subsumed into pictorial representation. In a characterization that seems counterintuitive at first, Leo Steinberg in his theory of ‘flatbed picture plane’ (1968) associated vertical orientation (the requisite of the illusion of depth in pictorial representation) with nature on account of the upright human posture that determines the usual way of seeing the world. He related horizontality, on the other hand, with the domain of work, in particular with the labour of making art, and with surfaces such as tabletops, floors, newspapers, maps etc. – “any receptor surface on which objects are scattered, on which data is entered, on which information may be received, printed, impressed” (Steinberg, 28). Nonetheless, Steinberg’s prediction of a paradigm shift from nature to culture is useful in relation to my work because it deals not so much with the physical placement of an image, but with a change in what he called the ‘mode of imaginative confrontation’ (ibidem). He was in fact challenging “the naturalization of art-making and interpretation” and “the artist’s position of visual mastery” (Boetzkes, 118) linked with the illusion of depth of pictorial representations.

Figure 4.9. *Lai da Minschun, Engadin, Switzerland, 19 & 30 July 2012*. Plant paper made on-site, sensitized photographically and exposed in a camera built partly from natural found materials. Work positioned vertically in a box, as exhibited in: AHRC Conference, Gallery North, Newcastle, May 2013, *n-lôg, -lg*, Newcastle, May 2013, and Terra *Incognita*, Stockton, June - July 2013. Work by the author.

This is perhaps particularly radical in the context of photography, where cameras are customarily pointed horizontally (resulting in a vertical image plane) to replicate the usual line of human vision. Tilting the receptive surface to a horizontal position (as it takes place in my work when screening the paper, in the ‘hole in the ground’ cameras, and later in the positioning of the finished pieces) implies an intention different than to reproduce the world pictorially. Such a setup in itself presents no greater technical difficulty in creating an image than having the receptive surface in a vertical position (in ‘hole in the ground’ cameras a mirror is used to project the image downwards; figure 2.10). Rather, according to Steinberg, it is expressive of my aim of revealing the mechanisms of photographic representation and drawing attention to the process of making (further brought to the fore by the film) that lies behind the illusion of depth of a photographic image. It indicates an intention “to reveal the work involved in coming to grips with (or one might say, finding a ground from which to see) the world" (Boetzkes, 118). Such '*de*naturalization' of the formation and perception of photographic images clearly reveals their conventionalized character as semiotic signs, not least because the photographs in this project are not readily identified as having been produced in this particular way. The latter is only indirectly indicated by the film (an iconic sign) and textual description (a symbolic sign), which signify by convention. By drawing viewers' attention to this network of signifiers and referents the work points to the propensity of all signs to effectively appear transparent and "disguise our task in 'reading' them" (Chandler, 11).

In terms of reception, horizontal positioning of photographs combines the visual and the sculptural and reminds viewers of the physicality both of the photograph and of their own bodies. For example, Jean-Marc Bustamante's *Stationnaire II* consists of photographs displayed in boxes placed on the ground with their lids to one side, or closed (figure 4.10). Upon entering the room the gaze skims over the surface of the prints and does not engage with the representation content as easily as in case of wall-hung photographs, thus challenging the perspective effect inherent in the optics of photography. Bustamante does not consider a photograph as a window, but retains the sense of it being an object that can furthermore be opened or closed (Bustamante 2011). This sense of a barrier that forces a distance between viewers and the work is further heightened by the images in the boxes showing a dense row of cypress trees that verge on abstraction, hovering between depth and surface. The result is similar to the nearly abstract image in my photographic objects. As one moves around Bustamante's installation, the perspective changes and with it the perceived shape of each print, again unlike in case of a vertical display when images usually retain their rectangularity from most viewing points. Looking down and navigating between the works, viewers remain aware of their body in space lest they disturb the arrangement. Bustamante reconfigures the dichotomies of photography and sculpture, the abstract and the figurative, presence and absence, by resituating the imperceptible "within a perceptual and thoroughly concrete, material, intact reality" (Lageira, 100).

Figure 4.10. Jean-Marc Bustamante, *Stationnaire II (Stationary II),* 1991. Colour photographs, cement boxes, resin. Installation in Musee d'Art Moderne de la Ville de Paris. Source: Bustamante 2005.

This change of perspective from looking across the space to a downward gaze (and the resulting relation of viewers to the work) corresponds to the contrast drawn by the philosophers Gilles Deleuze and Felix Guattari between 'striated' and 'smooth' space (408, 524-525). To look in striated space, which is homogenous and volumetric, is to, as Ingold suggests, "shoot visual arrows at their targets" (2011, 132) – it implies a distance and a separation between the viewers and the viewed. Smooth space, on the other hand, has no layout and the eye "does not look at things but roams among them, finding a way through rather than aiming for a fixed target" (ibidem). This roaming can be taken to the physical level not only by demanding that viewers move through the exhibition space, but also that they handle the works, such as is the case with my pieces placed in closed boxes. This further reduces the separation between viewers and the object that the horizontal positioning begins to erode by minimizing the illusion of depth characteristic of vertical display formats. In such an installation, the task of vision is not, as it would be in striated space, to discriminate and identify individual objects, but rather to register "subtle variations of light and shade, and the surface textures they reveal" (ibidem).

Conditions of reception and the aura of objects – boxes

The dark room installations that I have experimented with, as outlined in the second chapter (figures 2.29-31), sought to eliminate visual information surrounding the work and to get closer to removing the effect of a semiosphere (in itself an impossibility). But what they have demonstrated was the need for a better control of the conditions of reception – a construction of a particular semiosphere that would designate the non-pictorial objects as photographic indices, and traces of a particularly time-consuming and labour-intensive process. This can be analysed in the context of creating an aura of an object (as described in the previous chapter), which is instrumental in a particular kind of highly conventionalised reception. While the status of an artwork as auratic lifts the viewing experience out of the ordinary, installation art (which the dark rooms might be examples of) democratizes this experience – as the critic Mark Rosenthal wrote,

> because there is no frame separating this art from its viewing context, the work and the space having melded together into an approximation of a life experience, the sphere of art has effectively been compromised, even democratized (25).

If this is indeed the case, then installation art has the same effect as the rise of reproduction media such as photography and film had in the eyes of Walter Benjamin in the 1930s – "a dismantling of art's authority over the masses [and] … a destruction of its 'aura'" (Jones, 365)[57]. The dark room installations were intended to prioritize a phenomenological involvement with the pieces, but instead they drew attention away from the objects themselves and towards the experience of the dark space.

Specifically, the dark room installations were the opposite of an art object as a singular entity. Arguably, in installation art "the sanctity and sublime isolation of a sculpted art object, carefully if not extravagantly framed or literally on a pedestal, is absent" (Rosenthal, 25). This kind of 'sublime isolation', however, is what creates the aura of an object in Walter Benjamin's understanding[58]. The singularity of my

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[57] In fact, many installation artists use photography and film to this effect – not only are these 'non-elitist' media, but their products usually do not materialize in a single art object (they exist – if not actually than at least potentially - in multiple copies or, in case of film or images shown on screens, shift between numerous transmitters). To the extent that I use photographic methods to produce unique, auratic objects, my work constitutes a reversal of this property of photography, as previously mentioned.

[58] Even if this understanding is outdated – as was indeed, in Benjamin's view, the concept of the aura of artworks when he was writing in 1930s – it is still useful in the

works is of major importance as each one is meant to represent a particular place and time. In the two earliest exhibitions (figures 2.23, 2.24, 2.26), works were placed in small wooden boxes, and titles, together with project description and the individual displays showing the films documenting the making of each piece, designated them as photographs made in a particular way. In the dark room installations, however, this information could not be provided alongside the pieces in textual or visual form, because that would distract from the phenomenological experience of the works themselves. Another idea, to correlate the distribution of the pieces inside the space with the actual map of the area where they were made and present this information in front of the dark room, seemed too prescriptive. The objects could be experienced, but their indexical relationship to the particular locations and their photographic character remained unclear. An extreme loss of singularity of the objects occurred upon experimentally stacking the works on the floor (figure 4.11). As an installation piece, the room functioned as one entity, and undermined the artefactuality of each of the objects. Claire Bishop defined installation art as that in which “the space, and the ensemble of elements within it, are regarded in their entirety as a singular entity” (6).

Figure 4.11. Installation view of works in a dark space with some pieces placed 10cm away from the wall, and others stacked on the floor and spot-lit from above (February 2013). Work by the author.

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context of my work. While a ‘sublime isolation’ might no longer be possible, a sculptural understanding of my photographs that leads to establishing their presence as singular entities in the space where they are shown, and therefore to creating their aura, is an important development of the work.

It is the role of the boxes in which I have eventually decided to present the works to underline their singularity and heighten their aura. This effect can be demonstrated in the example of Bustamante’s *Stationnaire II* mentioned earlier, which was shown in 2011 with all the boxes closed and placed in a single stack (figure 4.12). Compared with the stack of my own works (figure 4.11), simply creating a space around each of them in the form of a box establishes their status as auratic objects being venerated more as presences than as images. As a result, the spatial context does not have an overbearing effect on the works, as it did when they were simply placed horizontally in a studio (as described in the second chapter; figure 2.27). The boxes with their museological connotations create the ‘myth’ of an auratic object and convince viewers of its presence without necessarily seeing it[59]. The film additionally strengthens this ‘myth’ by providing information about my interaction with the environment in the process of making the photographs. Since the prerequisite of the dark room installations was a lack of knowledge about the pieces inside, their aura could not have been created in a similar way.

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[59] Arguably, it was possible to show Bustamante’s boxes closed because the work, realized 20 years earlier, had its ‘myth’ well established.

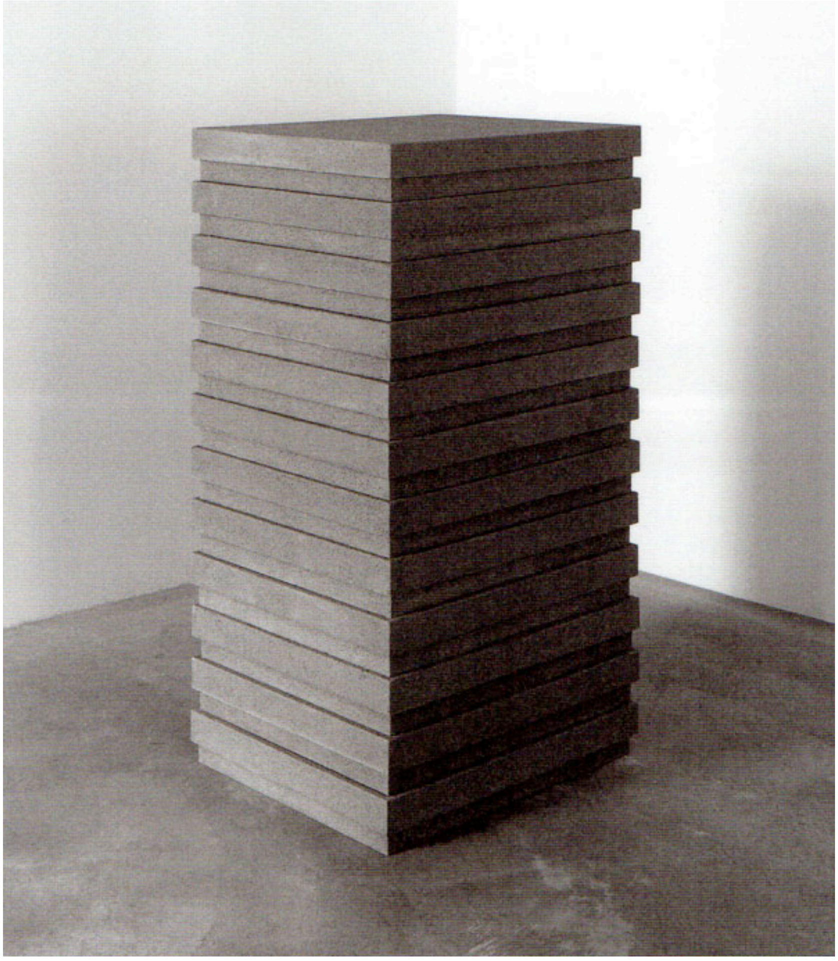

Figure 4.12. Jean-Marc Bustamante, *Stationnaire II (Stationary II),* 1991. Colour photographs, cement boxes, resin. Installation in The Fruitmarket Gallery, 2011. Source: Bustamante 2005.

Aura is a function of viewers' distance, rooted in the necessity of sacred religious objects remaining at a distance from the public. This distance is metaphorical as much as it is physical. Benjamin described it as "a strange weave of space and time: the unique appearance or semblance of distance, no matter how close the object can be" (1979, 250)[60]. Even if viewers are allowed to handle the boxes containing the works (as opposed to them being opened by a professional handler), the objects themselves can remain inaccessible and elusive, yet exuding power. The boxes are a significant refinement of the two earliest exhibition installations described above – they are built to resemble archival storage containers, and by giving rise to a very particular set of associations, direct viewers' experience of the work much more effectively. Lined with book cloth, they imply that their contents are valuable and need to be

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[60] Thomas Trummer analyses this distance in terms of spatial conditions of perception of artworks and concludes that "it was in a 'topology' that Benjamin showed that artworks can be auratic" (95). "The strange territory which makes itself felt in the work remains vague for the viewer as does his own position", he writes (ibidem).

preserved. There is also a sense of the works becoming more precious with time (something noted by a fellow artist even in the absence of the boxes). In comparison with the early wooden boxes, they incorporate the textual element of the work – the title consisting of the location, the landmark towards which the camera was pointing, height above sea level and dates of exposure – into their visual form by having it embossed on the lid (figure 4.13). This, as opposed to, for example, a handwritten label, imparts finality and permanence both to the object inside and to its placement in the box.

Figure 4.13. Closed box with title embossed on the lid visible. *Fuorcla Fenga Pitschna, towards Gemspleisspitze, Engadin, Switzerland, 2730m a.s.l., 1 - 12 Aug 2013.* Work by the author.

Upon opening a box viewers experience a shift from the textual (title embossed on the lid) to the phenomenological (the photographic object inside) (figure 4.14). This is not as much a suspension of a semiosphere aimed for in the dark room installations, as perhaps a (literal and figurative) *lifting* of the exclusively human sphere of meanings of the written word and *opening* to the meanings residing in objects and places. The confrontational character of viewers' encounter with the work is not unlike in the dark room installations (where viewers were unexpectedly finding in a dark room with the light of the torch one of the objects without knowing what it is), as the pieces remain similarly invisible from afar and experienced only at close quarters. However, as opposed to those installations, the boxes with their museological connotations establish the 'myth' of the objects inside them as auratic based on associations external to the works, just as the space of a museum or a gallery imparts value to the artworks inside. Thomas McEvilley has compared such spaces – in particular the ubiquitous white cube space - with chambers constructed for religious purposes (in O'Doherty, 8)[61]. Although the 'myth' of an artwork cannot compete with that of a religious relic as discussed in the previous chapter[62], it can, in case of my pieces, establish their status as unique artefacts signifying a particular time and place.

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[61] Thomas McEvilley compares white cube spaces with Egyptian tombs holding paintings and sculptures, or Palaeolithic caves filled with wall paintings, which were deliberately set off from the outside world and difficult to access so as to heighten their status as "magically contiguous with eternity and thus able to provide access to it or contact with it" (in O'Doherty, 8). Robert Smithson also compared galleries to churches, but made a crucial distinction between dark and bright spaces. At an early stage of his career, he expressed an attraction to "dark Roman churches (…) because much of the art [there] cannot be defiled by vulgar liberal eyes" (letter to Holt, 24 July 1961, in Crow, 41), as opposed to well-lit spaces where he deemed both his paintings and decoration of Roman churches to be "demeaned by an objectifying attention" (Crow, 41) he ascribed to tourism. His letters to Nancy Holt clearly express his disillusionment with Rome as a sacred place (and a traditional site of pilgrimage). He went on to dream of setting his paintings in a space similar to a dark church: "I would rather have people look at my paintings with a flash-light with the room faintly lit by violet lights and the air filled with the odour of heliotrope and jasmine" (letter to Holt, 24 July 1961; Crow, 42). This sentiment mirrors my own reasons for experimenting with dark room installations.

[62] The aura of religious objects is constructed through the stories and beliefs surrounding them, which the majority of visitors are familiar with even before setting out on the journey to visit them. It would appear that only in case of the most famous artworks could this effect be comparable to that of a religious object.

Figure 4.14. Box upon opening. *Fuorcla Fenga Pitschna, towards Gemspleisspitze, Engadin, Switzerland, 2730m a.s.l., 1 - 12 Aug 2013*. Plant paper made on-site and exposed for 11 days in a camera built partly from natural found materials. Work by the author.

Installation, non-pictorial representation and the categories of theatricality and absorption

While my intention for the dark space installations was to largely eliminate visual stimuli and direct the perceptual experience, the result was a decline of their aura and perhaps a case of what Michael Kimmelman called a “spectacle [that] may be allowed to supersede [or at least overshadow] content” (in Rosenthal, 92, fn. 4). Indeed, the lack of a single art object in installation art results in a certain theatricality, where viewers become aware of themselves looking. However, it might also be said that viewers of my work become aware of their own experience of the objects on account of the lack of pictorial representation – introduced as photographs, their opaque surfaces nonetheless return the gaze rather than allowing for any kind of illusion of depth to occur. The notion of theatricality might be therefore further complicated by considering the critic’s Michael Fried’s use of the term to denote a prioritization of the audience’s response in relation to representation, and the explicit purpose of being seen with which an artwork has been made. While it has been noted that in works of installation art in particular the spectator appears as integral to the realization of the piece (Reiss 1999), the foregoing of pictorial representation in my photographs and the resulting reliance on viewers and their imagination to ‘complete’ them could be said to have a similar effect. The film showing the making of the pieces introduces a performative aspect to the work, even though it presents a solitary process executed in the absence of any observers. Similarly, viewers’ active role in opening and closing the boxes containing the photographic objects (and, crucially, choosing which boxes to open and in which order) brings a degree of theatricality to their reception. This effect would have been even stronger if viewers had to remove a box from a shelf to see its contents, which was an installation possibility considered in the final stages of the project (figure 4.15), or if there was a handler facilitating this experience.

Figure 4.15. Boxes containing the photographic objects placed on shelves in Paper Studio Northumbria for viewers to handle. Presentation of the project, Paper Studio Northumbria seminar series, 7 November 2013. Work by the author.

Paradoxically, the lack of pictorial representation can also be characterized by the opposite of theatricality that Fried called absorption, an avoidance of producing an effect on viewers. The inherent ‘non-visuality’ of the photographic objects in terms of the nearly abstract image is further highlighted by placing them in boxes that conceal their contents. In this respect they are the opposite of the ‘on-display’ mode of existence of the work that was taken to the extreme in the dark space installations that relied on an illusion similar to that which the work itself, in its refusal to represent pictorially, rejects (while the works themselves lay bare the mechanisms and the materials behind photographic representation, the dark room installation contradicted this by concealing its own workings – i.e. the construction of the space was hidden in the darkness)[63]. In fact, many viewers of the dark room installation wanted to see the pieces again in a lit space, especially after learning they are photographic, which demonstrates that the effect of the darkness was at odds with the pieces themselves. Other steps taken to fine-tune the reception of the works include changing the colour of the book cloth lining the boxes from the initial black to neutral dark grey in order to eliminate the theatrical effect that black was found to have, as well as to better bring out the subtle tonal variations in the grass papers. For the same reason, I determined that the objects should be viewed in an even and neutral light instead of being spot-lit (as in the *n-lôg, -lg* exhibition, figure 2.25). Moreover, rather than the boxes being stacked or placed each on a separate shelf of a shelving unit, which would make the reading of the titles embossed on the lids (and therefore selecting a box by title) impossible before handling the boxes, I decided that they would have a fixed position (requiring viewers only to open and close them rather than move them around; for example, in the exhibition in Chur in December 2013 each box was placed on a wall-mounted shelf, figure 4.16).

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[63] The materials used to construct the blacked-out space were not meant to be seen in daylight, but rather were chosen and put together for a particular effect when touched and lit with a dim torch. Were they to be seen in daylight they would invariably look insubstantial and unconvincing. Depending on the construction of the space, its artificiality can sometimes even be perceived in the darkness (such as in the case of my first installation when the walls of the room were covered in black fabric only up to the height of 2m, leaving the upper part of the space – once the eyes have adjusted to the darkness - in plain view), requiring a theatrical suspension of disbelief.

Figure 4.16. *Jahresausstellung*, Bündner Kunstmuseum Chur, Switzerland, December 2013 – January 2014. Installation view of works placed in closed boxes on single wall-mounted shelves. Work by the author.

The opposition between theatricality and absorption is by no means clear-cut. Artist's commitment not to impose one's intentions on the audience can quickly transform into radical theatricality where only the viewers' response matters. As Walter Benn Michaels (2011) demonstrates on the example of John Cage's 'silent' piece *4'33''*, a refusal of intentionality and valorisation of the accidental result in a situation where not only the audience's recognition of the intention becomes crucial but paradoxically their actual experience becomes irrelevant – if the intention is not recognized, the audience 'misses the point' (and might start walking out, as the first listeners to Cage's piece did when the pianist did not play). The same might be said of my works – although they can be appreciated for what they are, I feel that it is in the combination of sensuous engagement and conceptual understanding of the process of their making (and therefore their indexical and photographic character) that the meaning of the work resides. The early films documenting the making of each photograph were intended to provide the knowledge of the process, and I found them to do it far better than its textual (or verbal) description. In their absence it was more difficult for viewers to engage with the work, and to imagine how the pieces were actually made (for example, when presented at the Open Studios Day, Nairs, 2012, figure 2.27). Because of the stark difference between the embodied perception of objects and the visual perception of images noted before, since the *n-lôg, -lg* exhibition (2013, figure 2.25) I endeavoured to place the objects and the films in separate spaces to first enable a quiet encounter with the subtle photographs and then an immersive experience of the films. However, on the occasion of the group exhibition in Chur, where there were more works by other artists positioned in the same space, placing the boxes and the monitor with the films on separate walls has also worked well (viewers could not look at both simultaneously; figure 4.17). The connection between the objects and the films was not immediately clear, especially that the monitor appeared at first as a separate work by another artist, and it was only after reading the label indicating that the two have the same author, or after realizing what the films are showing, that viewers discovered the link between the two. Similarly, the connection between the photographs and the film in its final form, which moves away from the role of documentation and indicates the process of making the photographs more indirectly, has to be inferred. It is through the gradual discovering of the network of signifiers and referents that viewers experience the process of meaning-making in response to an index – sensing the connection between the photographs and the sites, reading the description on a label designating them as photographic, identifying the film as a sign indicating the objects, and the objects as artefacts produced in the process shown in the film.

Figure 4.17. *Jahresausstellung*, Bündner Kunstmuseum Chur, Switzerland, December 2013 – January 2014. Installation view of works placed in closed boxes on single wall-mounted shelves, with the films showing the making of the pieces screened on a monitor. Work by the author.

It is important to recognize the works' rejection of the illusion of depth created by pictorial representation (and therefore their anti-theatricalism) as a means to an end. The project's goal is not to turn away from the image, but rather to shed light on the limits of what it can represent, and on the difference in reception of objects and images. The film therefore does not undermine the overall premise of the work, but rather strengthens it. My choice of a technique that gives up much of the intentionality present in the medium gives an impression that I am not seeking to produce a particular effect on the viewers. But even though I am not troubled much about composition, exact level of exposure, the look of the plant paper, or even whether an image is eventually visible or not (although the premise is always to produce one), the implications of this way of making photographs and the context of their reception are firmly established. The anti-theatricalism of the work reaches only as far as its aim is to represent a place without imposing a singe image standing for a complex experience of the location. From this point of view, any illusion of depth that a photograph offers is theatrical - Roland Barthes argued against theatricality understood in this way in *Camera Lucida:* "to see a photograph well, it is best to look away or close one's eyes"; "the photograph must be silent", not "blustering" (1981, 53). On the other hand, "If you were to make an object that was literally impossible to see as a picture", Michaels writes, "you would … reproduce the crisis of absorption …[,] you would produce an object without any form" - a paradoxical situation where artworks "seek to produce no effect on the beholder", but without this effort "there would be no works of art" (2011, unpaginated)[64]. However, the insistence in my work on the central role of the process of making the pieces (underlined by the film) and their existence as artefacts rather than images result in the meaning not depending entirely on the viewers but being largely inherent in the work itself (as Peirce asserts, the

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[64] For the same reasons (and roughly at the same time) that critics such as Roger Scruton, discussed above, denied that there is enough intentionality in photography for it to be considered fine art, others saw photography as a solution to the crisis. While a photographer intends for a photograph to have a certain effect on the viewer, the automaticity of the medium means that what the photographer "sought to produce may have nothing to do with the beauty, value of meaning of the photograph" (Michaels 2011). This is in line with Roland Barthes's view that the author's declared intentions are irrelevant to the production of art. Hence his concept of the photographic *punctum* - the accidental and unintended effect of a photograph on the viewer. In this sense photography appeared to those critics as a means of producing anti-theatrical works of art. However, as Michaels shows, there is another paradox to this "aesthetic indifference" of absorption in that, with the *punctum* resisting photographer's "inevitable theatrical efforts to produce a particular effect", the photograph is transformed "into a work dependent entirely on the beholder — a purely theatrical object" (Michaels 2011).

connection of an indexical sign to its referent is causal rather than conventional, and therefore independent of an interpreting subject, unlike in case of symbolic and iconic signs [CP 2.92, 2.98])[65]. The photographs are meant to be experienced, but the experience in not the primary goal – rather, it is instrumental in relation to a reflection on the character of photographic representation. The objects act as residues of the process, and their role is to substantiate it, to provoke questions about the reason for – and the implications of – making photographs in this particular way, and to ultimately point to place - and an embodied experience of it - as eluding representation.

Perception of non-pictorial photographs as objects

The meaning of the work in this project arises from a combination of sensuous engagement and conceptual understanding. This is equivalent to indexical signs, in Peirce's words, "direct[ing] the attention to their objects by blind compulsion" (CP 2.306), while their relationship to the referent needs to be recognized by inference. Viewers of my work engage with the photographic objects, while also necessarily drawing on culturally-coded signs such as titles, boxes, the film and the space where they are located to assign meaning to them. Because the original sites are represented as (visual) absences, and the film focuses on the process of producing the photographs, it could be argued that it is the referential system that is in the foreground rather than the referent, the relation being like that of language to the world. However, the work has to be distinguished from entirely conceptual pieces in which the object is merely a "vehicle for the paradigmatic schema of the piece" (Miller, 133). The materiality of the photographs challenges "the emptiness of a textual signifier" (Boetzkes, 58) that substitutes for the site, and reveals the earth's excess "as an obstacle to meaning, an obstruction of visual coherence, and ultimately of the earth's otherness that has escaped signification" (Boetzkes, 61). The importance of tactile engagement on viewers' part that is analogous to

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[65] This calls to mind the oft-quoted philosophical thought experiment that asks: 'if a tree falls in a forest and no one is around to hear it, does it make a sound?'. From the point of view of indexicality, the answer is affirmative – moreover, even if the sound was beyond the limits of the human range of hearing, it would still exist. As I have outlined in the first chapter, a similar principle applies to my definition of photographs, which includes those that might not have a clear image even though an exposure has taken place. The conventional signs that surround such objects (film, label, etc.) might be therefore seen as a 'translation' of those unperceivable indices that brings them into the range of the discernible. It is in this sense that the work combines extreme absorption with theatricality.

my own involvement with materials when making the photographs is signalled in the conditions of reception of the work. In the finalized installation, the boxes are placed closed on tables, and viewers are asked, through written instructions, to open and close them to see the objects inside (figure 4.18). A variety of tables were considered for this purpose in a search for one that would be suitable formally and visually, including a working table (rather than one made specifically for the purpose) positioned in a studio area (instead of a neutral gallery space; figure 4.18).

Figure 4.18. Boxes with works placed on a table in Paper Studio Northumbria. Work by the author.

Placing the photographs on tables in boxes reminiscent of an archive clearly communicates to viewers that, as in the case of Robert Smithson's *Nonsites* or Bruno Jakob's canvases, they are asked as much to sense as to understand the artworks[66]. Jakob's canvases demand a tactile rather than a visual response by being suspended in the middle of the space instead of pressed flat against the wall (figure 4.19). This type of reception is very different to conceptual works such as

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[66] In case of Smithson's *Nonsites*, some theorists equate their non-visuality with "absence rather than presence, referential points rather than sensuous surfaces, nonseeing in place of optics" (Hobbs, 13), but in fact their materiality plays a crucial role. Smithson clearly recognised not only the insufficiency of an image to represent place, but also that an image never exists independently of matter. He regarded art that only deals with the mind as incomplete: "I'm for a weighty, ponderous art. (…) There is no escape from the physical nor is there any escape from the mind. The two are in a constant collision course" (in Lippard, 89). Similarly, "it would be easy to view the works of Bruno Jakob as the heritage of constructivism or concept art. Such a classification would however fall short of the works of this artist" (Artnews, 2012).

Huebler's *Duration Piece #5* (figure 3.4), or indeed, as I would argue, to photographic reproductions. In fact, by underlining their objectness, the positioning of my pieces triggers a process of meaning-making that is of a different kind than recognizing the subject of pictorial representation. As described in the first chapter, it is an intuitive, non-conventionalised type of meaning that we truly assign to an unfamiliar object as soon as we can because it is physically there in front of us and therefore more real, impossible to be disregarded. To then identify an object as a photograph, based on a textual description on a label, is not so much to *re*-categorize it, as to add a new, conventionalized layer of meaning to it – that is, to place it in the category of photographs *in addition to* the category of plant papers (or whatever the object was identified as). Further, by getting a sense of the particular environment and the process of making the pieces through watching the film, viewers might begin to perceive them as 'receptive surfaces' for "that which is invisible, hidden, latent, or evanescent" (Rugoff, 61). The photographs might then be understood as indices of elementals, which can be seen and felt, but inevitably exceed the perceptual field. Ultimately, however, the representation of place as elemental happens through imagining it that is triggered by sensuous and cognitive apprehension of the work. As Sallis writes, "distinct both from intelligible [archetypes] and from sensible things, the elementals constitute a third kind that is such as to disrupt the otherwise exclusive operation of the distinction between intelligible and sensible" (2000, 235).

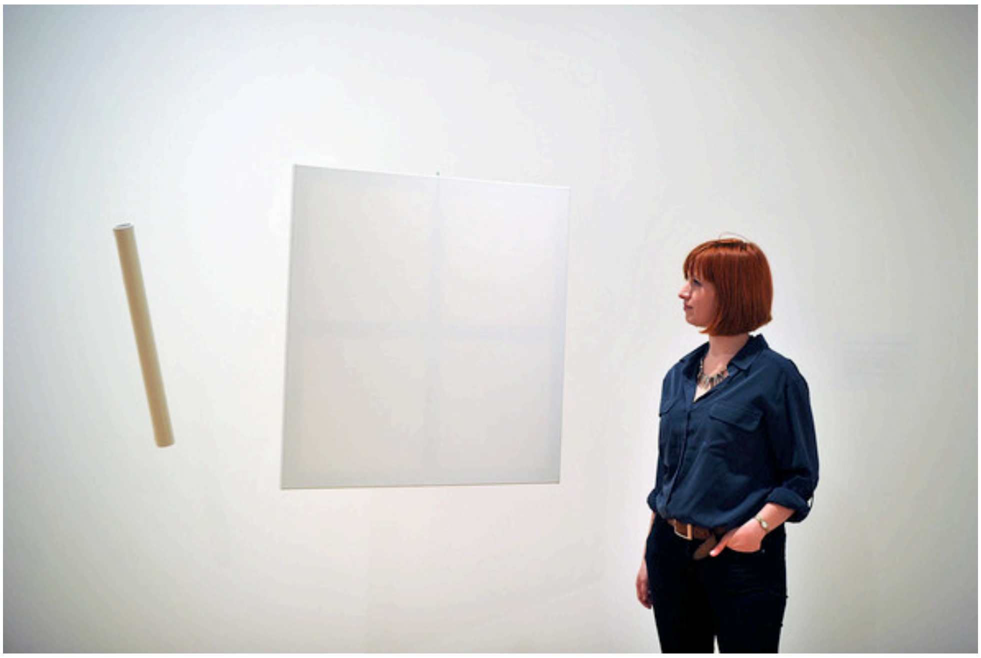

Figure 4.19. Bruno Jakob, exhibition view, *Invisible. Art about the Unseen. 1957-2012*. 12 June – 5 August 2012, Hayward Gallery, London. Photo: Bethany Clarke/Getty Images Europe. Source: http://www.zimbio.com/pictures.

Upon opening a box and momentarily struggling to make sense of the unfamiliar thing inside one might more clearly experience the cognitive process of perception as characterized by Peirce. It is a response to an indexical sign that Peirce has defined as "anything which focuses the attention (…). Anything which startles us" (CP 2.285)[67]. As the semiotician Umberto Eco writes, the first fleeting moment of perception that Peirce called Firstness is the very awareness of something in its absolute and atemporal singularity, a presence 'such as it is', "no more than a positive characteristic" (Eco, 99). This moment Peirce characterized as primary iconicity, where there is only "the pure quality that in some way emanates from the object" (Eco, 112)[68]. In it only in Secondness that an obtuse appearance takes shape, "an index of the fact that there is something to perceive" (Eco, 114). This moment of primary indexicality "has the form of a shock" – "it is an impact with an individual, … that 'strikes' the subject without being a representation yet" (Eco, 99). What forms in Secondness is not yet a full perception but what Peirce called a *percept,* described by him in an evocative passage as that which "knocks at the portal of my soul and stands there in the doorway" (in Eco, 114; figure 4.20). Thirdness takes place when the perceptual judgement 'desingularizes' primary iconicity (Eco, 115). The object is classified as made out of grass. If the tonal variations on the paper's surface that were attributed no significance at first suddenly make sense as having a causal relation to the referent, an image of which can perhaps even be recognized among them, than the object might be further classified as a photograph. Although Peirce's description concerns perception in general, this process becomes more distinct when one comes across an unfamiliar object, as was illustrated in the first chapter by the anecdote about the Bush-woman being given a photograph without any prior knowledge of what photography is. My work puts viewers in a similar position - the denial of the photographs to represent pictorially means that they are not read immediately as iconic signs (that is, by employing a learned convention), but

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[67] Of course, since Peirce's categories of signs are not mutually exclusive, this description characterizes, to a greater or lesser degree, a recognition of any sign, in particular its indexical qualities. Peirce has written that "it would be difficult if not impossible to instance an absolutely pure index, or to find any sign absolutely devoid of the indexical quality" (CP 2.306).

[68] The primary iconism is a correspondence between the stimulus and the sensation, without it yet being a realistic proof of the existence of the object. "Firstness lets us know that *it is possible* that something is there", but saying that it *is* already belongs to Secondness (Eco, 113). This is why Peirce stressed that although Firstness can be logically separated from Secondness, it cannot occur in its absence (Eco, 109).

rather gradually made sense of as indices – physical traces the causes of which are not instantly apparent[69]. While “iconicity is closer to ‘direct perception’”, “indexicality is based on an act of judgement or inference” (Chandler, 38).

Figure 4.20. *Val Zuort, towards Piz Zuort, Engadin, Switzerland, 1720m a.s.l., 3 – 9 Jul 2013.* View of the work at an angle. Work by the author.

People are able to identify something as a photograph because they possess a cognitive type for such a category of objects[70]. They might be able to recognize a photograph without having seen one before based on the knowledge of what photographs are, as might have been the case in the early days of the medium. Moreover, a person already possessing a cognitive type of a photograph will also

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[69] I have initially taken this analysis of the cognitive process of perception and recognition by Umberto Eco (in accordance with Peirce’s semiotics) as a guide to constructing viewers’ experience of the dark room installations. Because such spaces minimized viewers’ preconceptions about the encountered works, Firstness was thought to become more distinct upon unexpectedly finding in a dark room with the light of the torch one of the objects without knowing what it is. Secondness indicates recognition of an object, and viewers of the dark room installations most often commented on first noticing the abstract tonal variations, surface characteristics (compared variously to hair or skin), stiffness, softness and fragility of the objects (the latter suggested, for example, by the bottom right corner of the work in figure 2.31 hanging by a few threads of grass). What Peirce called Thirdness took place when the viewer thought ‘this object looks like skin’. The role of adjusting this hypothetical perceptual judgement was assigned to the films documenting the making of the works, which were intended to be seen only after the initial encounter with the works in the dark space, for example in a separate room.

[70] Cognitive types might be formed through individual perceptual experience of encountering multiple instances of something incomprehensible (and elaborating a cognitive type to be able to recognize its other representatives), or they might be transmitted culturally in the form of what Eco calls nuclear content (which is what a cognitive type becomes when it is communicated, therefore ceasing to be private and becoming public – a series of *interpretants*). Transmitting the knowledge of what photographs are (that is, describing to someone what they should look out for to identify a photograph) might pose some difficulty because photographs *look like* what they represent, but this can be overcome by referring to something already familiar, for example by characterizing photographs as ‘particularly realistic prints’.

be able to recognize a less-than-perfect photograph (for example a blurry one) if other elements of the cognitive type are identified, such as the material format or the context usual for photographs. On the other hand, when a photograph does not conform to the established cognitive type, it challenges the existing categorial framework. There are some conditions that are 'sufficient' and others that are 'necessary' for a recognition of an object, depending on perceptual and cultural factors (Eco, 239). Photographs can be defined, as it is done here, as results of a process of exposure of photosensitive material in a camera, in which case this would be their only 'necessary' characteristic. But because "the recognition of a property as indelible depends on the history of our perceptual experiences" (Eco, 240) and our perceptual experiences of photographs indicate that they represent by resemblance, being a likeness appears as a necessary condition for recognizing them. However, Eco argues that artists question conventions and perceptual schemata "by inviting us to recognize that in certain circumstances things could also appear to us differently, or that there are alternative possibilities of schematization, which make some features of the object pertinent in a provocatively abnormal way" (223)[71]. It would therefore appear possible to make viewers recognize plant papers with vague tonal variation (figure 4.21) as photographs by constructing a context (a network of intertextual references and a system of expectations) that establishes some properties as more relevant than the one of resemblance[72].

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[71] Every time we encounter something, we put to work diverse cognitive types to categorize it according to our knowledge. We might put Chuck Close's portrait in the category of photographs and Jorma Puranen's landscape in the category of paintings. But as we observe, certain properties of the object might challenge the categorial framework. We might notice brushstrokes in Close's portrait or photographic grain in Puranen's landscape, or indeed read artwork descriptions that contradict our initial observations. In such cases, as Eco writes, attempts are made to adjust the framework (249). We realize that it is possible for a painting to be done so meticulously as to appear as realistic as a photograph, or for a photograph to depict a reflection in a surface that makes the view look like a painting. Cognitive types are adjusted not only by our own observations but also by being subjected to public control – "the community educates us step by step to match our own to those of others" (222).

[72] Eco writes of 'iconographic courage' required to do so (240), and incidentally a few people has described the work in this project as 'brave'.

Figure 4.21. *Val Zuort, towards Piz Zuort, Engadin, Switzerland, 1720m a.s.l., 3 – 9 Jul 2013.* Plant paper made on-site and exposed for 6 days in a camera built partly from natural found materials. Work by the author.

However, it has to be stressed that any indicators that designate an object as a photograph are necessarily culturally coded (including the property of resemblance). This became clear in the process of finding the right conditions of reception for the works in this project – and therefore of renegotiating, as Eco would say, the meaning of the term 'photograph' when its defining properties in the current meaning are denied. Non-pictorial photographs rely entirely on conventional signs to be recognised as such. Those signs (titles, textual description, placing the pieces in archival boxes, displaying the film that shows their making, the space of viewing the work[73], etc.) are 'pointing' to the indexical nature of the objects, and are therefore themselves indices in Peirce's understanding of the index as a pointer (Short, 49). To differentiate between those two types of indices, it might be useful to elaborate on the already mentioned Van

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[73] Even though the film shows my interaction with the environment that does not resemble conventional picture taking, some elements of photographic apparatus such as a light-tight box or a lens can nonetheless be spotted. The space can also directly indicate the works' photographic nature, as was the case in the Altes Spital exhibition in 2011 organised in a photographic darkroom (as described in the second chapter).

Lier's distinction between *indices* (the objectively given) and *indexes* (the subjectively intended). Photographs are *indices* – physical results of a photographic process that "do not refer, they carry but do not point, they signal but do not designate" (121), unless they are *indexed* and therefore pointing to their referent (he calls photographs "possibly indexed indices" [118], or "contingently indexed indicial imprints" [111]). *Indexes* are all the intentional gestures such as framing, adjusting exposure, etc., but also decisions regarding presentation, and – in the case of my work – the film. The need for *indexes* became clear when, during the Open Studios Day in Nairs, 2012 (figure 2.27), the visual information in the space surrounding the works seemed to overwhelm them, rather than provide signs for interpreting them as photographic objects, and later, in the dark room installations (figures 2.29-31), where viewers were left without any indications whatsoever as to the nature of the objects found inside. Although the experience of an object is sensuous and non-conventionalised, we always draw on the interpretation of its context to assign meaning to it.

Non-pictorial photographic objects as gestures of dissent

While the experience of viewing the work is highly conventionalised – culturally-coded signs such as the space where it is shown, tables, boxes, labels, etc. are interpreted before the photographs are even seen - the encounter of the latter pries a gap in the ceaseless succession of signs 'read' according to learned knowledge. As unfamiliar objects not conforming to the collective idea 'a photograph', they are sensed but not understood, forcing viewers to draw on experiential knowledge, which tends to circumscribe the use of learned knowledge, in an effort to make sense of them[74]. Even if only for a short moment, they signify purely indexically, merely attracting ones attention to their causes. They are like pokes in the back that prompt one to turn around spontaneously – a situation that gave Peirce the idea to include in his semiotic system non-arbitrary, causal signs that are interpreted based on experience, or even without conscious thinking on the part of the interpreter. This is in contrast to Ferdinand de Saussure's semiotics based on a linguistic model where the relationship between sign and referent is conventional and arbitrary – a mental process of interpretation

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[74] Eco differentiates between a dictionary definition that indicates a categorical system, a scientific point of view, and is based on learned knowledge of where something has come from or what it is made of, and an encyclopaedic definition, based on the immediately observed properties of an object (Eco, 224-226).

based largely on learned knowledge is necessarily involved. Images, I argue, are also interpreted in this way. But neither words nor, as I have hoped to show in this research, images exist independently of the physical world[75]. From the perspective of a system of semiotics consisting, such as that of Saussure's, entirely of conventional signs, objects are, in the words of the artist and curator Chris Dorsett, 'the greatest gestures of dissent' (2012). Because they are always irrefutably there whether any meaning is ascribed to them or not, they can also be said to always escape meaning, or to be beyond meaning. It is in this sense of being experienced first as objects and only then as, in Van Lier's terms, *indexed indices*, that my photographs are subversive in relation to photographs understood as conventional signs.

The final installation of the work – the photographs are placed in boxes lying flat, with lids closed, on three tables made especially for the purpose to accommodate a row of five boxes each (figure 4.22), ideally positioned on their own in a white room with subdued lighting – is intended to create a neutral space for experiencing the subtle objects. Although the boxes and the tables inevitably signify by convention through their museological connotations, these are carefully controlled and serve to direct attention to the objects themselves, not least through the materials used, such as the dark grey book cloth of the boxes and neutral grey archival paper lining the tables. Within this context of an entirely cultural system of meanings (an art exhibition in a gallery) that creates an expectation of seeing an artwork that signifies by convention, upon opening a box an object is revealed that first and foremost demands an embodied response - it looks thin and fragile, smells of grass, evokes a desire to touch it. Moreover, the context is also established as photographic, through project title, information on the labels, and possibly through other works in an exhibition. What is primarily seen in a box, however, is an object rather than an image. Such a juxtaposition of semiotic domains results, as Dorsett notes, in "an inevitable breech in interpretative coherence" (2010, 249). Furthermore, he argues, "in situations where semiotic processes conflict, material otherness can violate the authority of textual commentary" (2010, 250). The objects immediately demand an embodied response and signify a place where they were made through their materiality, despite being designated as photographs and therefore in need of being 'read' as

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[75] The case for written language is argued by David Abram in *The Spell of the Sensuous* (1997).

images. This experience of objects is universal (a Bush-woman is as likely to understand the connection between the object and the site as a gallery visitor) and much less disciplined than recognizing a subject of pictorial representation. It therefore threatens to destabilize a conventionalized process of signification of an iconic sign.

Figure 4.22. Boxes with works placed on three long tables made for the purpose. Work by the author.

Where there is no clear pictorial representation in a photographic context, a potential for intuiting and hazarding iconic meanings on a more personal level emerges. The pattern of tonal values in one of my photographs will look like one thing to one person and something else to another. As Dorsett points out, “iconic signs remain embedded in the singularity of personal experience” (2010, 254), although their interpretations “can be simultaneously diverse and shared” (ibidem). So even when the title of a piece of mine identifies it as depicting a view from a certain place, and half of the sheet of paper is of a lighter tone than the other half (figure 4.23), someone might interpret this tonal difference as the horizon and draw another person’s attention to it, but for each of them this likeness will look slightly different. This kind of meaning-making is subversive in relation to the photographic iconicity that assumes everyone sees the same thing in a realistic photographic image. It can only take place when photographs are perceived firstly as objects (primarily indexical signs) and only then made sense of as potential images. As such, the pieces reflect my own subjective and embodied perception of the environment while making them, whereby direct surroundings are *felt* with all the senses as an active entity that one participates in. Abram writes that

> If (…) we wish to describe a particular phenomenon without repressing our direct experience, then we cannot avoid speaking of the

> phenomenon as an active, animate entity with which we find ourselves engaged. To the sensing body, nothing presents itself as utterly passive or inert. Only by affirming the animateness of perceived things do we allow our words [likewise, artworks] to emerge directly from the depths of our ongoing reciprocity with the world. (1997, 56)

To abstract from this experience the visual perception of the world ‘out there’ and fix it in an image would be to objectify it as something independent from the observer, and to place viewers in a passive role of interpreters of visual signs.

Figure 4.23. *Val Urschai, towards Piz Faschalba, Engadin, Switzerland, 2120m a.s.l., 21 Jun – 1 Jul 2013.* Plant paper made on-site and exposed for 10 days in a camera built partly from natural found materials. Work by the author.

However, the tonal difference in one of my pieces would be unlikely to be interpreted as an image, however vague, without external, conventional signs designating the object as an artwork and a photograph. An index fails to represent, it only calls attention to the referent. In that sense, it is the conventional signs surrounding it that, as Van Lier argues, are “the only unequivocally semiotic elements of a photograph” (47). They *index* the *indices,* creating a network of semiotic relations with the objects at its centre. Some do so more directly than others – the film is edited and positioned in the final installation so that its relation to the objects is not immediately clear. As *indexes*, the titles, boxes, space where the work is situated etc. only point, select and organize the information carried by the *indices* (but they designate nothing by themselves, they merely indicate, therefore supplying Peircean ‘independent knowledge’ necessary to recognize *indices*). The film, on the other hand, is immediately perceived as signifying iconically, but its purpose in relation to other elements of the installation is not signified by convention (as is the case with labels or boxes), but has to be inferred (it is indexical). Unlike in the earlier films that had a more documentary role, the doubt about the relevance of what is shown in the final film to the photographs is never entirely removed, leading viewers to experience an index as being always on the verge of failing to signify. However, the film is crucial in its role of *indexing* the objects because without it viewers would have little or no sense of the photographs being the outcomes of a particularly time-consuming and labour-intensive process taking place is a specific environment, and therefore would not experience a sense of privilege and intimacy at encountering an object I have gone to such extreme lengths to make. The work would also not be understood as attempting, and failing, to express my embodied interaction with natural surroundings, and hence as testifying to the “impossibility of subsuming the earth into representational form” (Boetzkes, 57).

The final decision regarding installation of the work is to place the film, where possible, in a separate space, to present no distraction to the experience of viewing the photographs, and to put a temporal and spatial gap between the two encounters. It can be projected where a suitable room is available - a projection has the benefit of appearing to have no tangible form (unlike a monitor that has a physical presence), and therefore having none of the sensibility of *indices*. But the exact installation should be adapted to each space where the work is shown, so that attention is directed to its content rather than its form and it is allowed to operate as much as possible as a conventionalized sign (similarly to a text on a label being printed according to the format adapted by a particular gallery or exhibition). It can therefore equally be screened on a monitor, such as in the exhibition in Chur (figure 4.17). Despite the two elements being located in one room, viewers of the exhibition spent time with the photographs first and only subsequently moved to see the film – possibly because the boxes were located on the entrance wall, but also because they appear more enigmatic and intriguing, they pose a challenge and require effort for their contents to be discovered. It seems, therefore, that, placed in boxes and on tables, the pieces have enough presence in the space not to compete with the film for attention, as was the case in the first exhibitions in the project. If conventional signs surrounding the objects direct the right kind of attention to them effectively, the latter have the capacity, through eliciting a direct, embodied response without clearly denoting anything beyond themselves, to destabilize the conventionalised system of signification in which they are embedded. Hence, it is only in combination with conventional signs that the objects are subversive in relation to them.

Chapter conclusion

This chapter traced my growing understanding of how recognition of an index depends on other, conventional signs indicating its relationship with the referent and, likewise, how reception of my non-pictorial photographs is shaped by other elements of the work that designate the pieces as photographic, unique objects produced in this particular way. The process of testing out various installation possibilities that lasted throughout the project was in fact a matter of constructing a network of semiotic relationships between the elements of the work that would allow viewers both to experience the unintelligibility of a photographic index and to understand how it was made, and therefore what it indicates and what are the implications of a photograph signifying indexically through its material presence. I have experimented with the space where the pieces are positioned, including dark space installations, with the kind of boxes in which they are placed horizontally, with the structure supporting them (wall-mounted shelves, shelving unit, table), with the degree of physical participation asked of the viewers (lifting the boxes off shelves, opening them), with the placement of the titles and textual information about the process, and with the function, form and position of the film showing my involvement with the environment in the process of making the photographs. All these elements alter the meaning of the work by bringing to it their own connotations. Moreover, it could be argued that they themselves *make* the photographs as indices by, in Van Lier's understanding, *indexing* them – that is, pointing to their status as photographic traces that would otherwise remain unrecognized. Their relationship with the photographs varies from one that is conventionalised and symbolic, such as that of titles and labels, to one that is to a large degree indexical and in need of being inferred, such as that of the film giving a sense of my activity that the photographs are a result of.

The process of constructing the conditions of reception of the work can also be understood as bringing the photographic indices that represent, in a non-conventionalised manner, places as elemental (that is, existing beyond the sphere of meanings that are entirely human) into the realm of conventionalised signification. Arguably, being an entirely human pursuit, my action of recording the direct, embodied experience of place already shifts it into the domain of culture. Viewers' initial tactile, olfactory and visual experience of an unfamiliar object and the feeling of being unable to grasp its meaning reveal an index as triggering an immediate, subjective, intuitive response but failing to clearly designate its referent. It is only in combination with a subsequent conceptual understanding of the labour-intensity, time-scale, locations and the photographic nature of the process of making the objects - communicated through conventional signs (titles, text, film) - that the pieces emerge as attempts at representing the elemental character of the particular places. Moreover, such intellectual apprehension of the effort required to produce the photographs adds a certain substance and sincerity to the claims that the work is making through the physical presence of the pieces. It is through the combination of the sensible and the intelligible that viewers actively *imagine* the photographed places and complete an act of representation – it is in this way that a photographic index can signify the elemental, “surpass[ing] in every way the ‘intellect’ that might think its concept and the ‘sensibility’ that might receive it” (Freydberg, 97).

Conclusion

The research project has arisen from my embodied experience of natural surroundings as a walker and from my interest in the concept of photographic indexicality – not only from the position of theory, but primarily from the position of a practitioner conscious of the inadequacy of the photographic image to represent place as that which reveals itself as what David Abram calls the “more-than-human matrix of sensations and sensibilities” (1997, 22). I have proceeded by investigating the semiotic concept of indexicality in relation to theory of photography and using it to contextualise my own intuitive understanding of the medium - as a mechanism for producing physical traces of contact - that has guided my artistic practice. This inquiry has convinced me that photographs can signify indexically, through their physical presence as traces of the referent, irrespectively of their properties as an image. I have attributed the tendency within theory of photography to write about indexicality as pertaining to the image rather than the object of a photograph primarily to the fact that, generally, contemporary use of the medium, whether analogue or digital, relies on the reproducibility of an image, which travels between various materials that, beside the original negative or digital sensor, bear no relation to the time and place of exposure.

I subsequently focused my artistic practice on developing such a technique that would produce photographs having the greatest possible connection to the site of their making. Sustained experimentation has resulted in finding a way of producing paper on-site from available plant materials, and of using photosensitivity of the pigments it contains to expose a rudimentary photographic image in a camera built there partly from found natural materials. This process, together with travelling to remote alpine locations to make the work, filming my activity, and exhibiting the results, formed tools for researching the question of photographic indexicality from the perspective of a maker. Although the inability to produce an image on the plant paper was initially taken as a failure, it was in fact crucial to discovering how photographs can evoke a sense of what Roland Barthes has famously called ‘having-been-there’ through their physical presence and composition rather than (as Barthes argued) through pictorial representation (1985). Photographs can function as indices not only of the light falling onto their surface but equally of the physical and environmental conditions such as topography, vegetation, natural materials and water in the area, as well as weather and humidity during the period of exposure. They can also be indexical of the lengthy, physical and labour-intensive process of involvement with a site in the course of their making that is very different to its primarily visual apprehension through a viewfinder of a camera. The research challenges therefore the prevalent view of photography derived from Barthes and suggests a way to move beyond it. The work is process-based, in that although the physical form of the photographs is important conceptually, I did not strive for a certain visual or formal effect. Once the method has been established, I proceeded to realize the pieces, each of which, irrespectively of its shape, was intended to function as a testament to the event of its making having taken place. Considering the experimental nature of the processes used, there is plenty of room for improvement, but also possibilities for applying them in contexts that differ both in practical and theoretical terms.

Further, I have proposed a connection between those aspects of the sensuous surroundings that are characterized by philosophical concepts such as the more-than-human and the elemental (as existing beyond the sphere of human meanings, perception and understanding), and the semiotic concept of indexicality within the context of photography. “We respond to and interact with elementals, but they register through a different mode of contact”, Amanda Boetzkes writes (102). Perhaps light, that which forges a link by successively touching the subject and the photographic surface, is the right ‘mode of contact’ for representing the elemental. Photography – literally ‘writing with light’ – is a mechanical process taking place essentially independently of human intervention. It produces objects altered by the action of light that only signify as images because the apparatus (and, as Vilem Flusser argues, its operator) have been ‘programmed’ to output objects where this light imprint can be interpreted by convention. I have suggested that what David Abram argues for written language is also true for images: they “interrupt the spontaneous sensory reciprocity between the human organism and the organic world, the spontaneous solidarity and participation between the human senses and the whole of the sensuous surroundings” (2004). When the ‘program’ is disturbed - as I have found out through constructing primitive cameras and sensitizing photographic materials - photographs can function as pure indices, pointing to their causes in a non-conventionalised manner, through the physical presence of a trace. The medium, therefore, has the potential to represent the elemental as that which itself exists beyond a conventionalised system of meanings. It can “slip beneath the exclusively human logic continually imposed upon the earth" and "catch sight of [the] other, older logic at work in the world" (Abram 197, 268).

I have also proposed the concept of photography developed through my practice as a voice in a wider debate about the role, firstly, of physical involvement with materials in the process of making, and secondly, of embodied perception in the process of reception, at a time when interaction with the world is increasingly mediated by the visual (whether pictorial representations or prioritizing optical impressions). Moreover, I posited my purposefully slow and absurdly labour-intensive method of making photographs as intrinsically valuable - a form of play that might be of particular resonance in what Vilem Flusser predicted to be a society based on the production of information rather than objects (1986b). The work also raises issues around technology as presenting the world entirely from a human perspective (what Heidegger called Enframing) by encouraging viewers to *imagine* the represented entities rather than offering their *image*. As Paul Virilio argues, imaging – that is, photographic technology and other optical devices designed to allow us to see "further and better the unseen of the universe" - altered our ability, rooted in the body, to *imagine* it (1994, 4). The elementals, however, as Sallis has it, exceed both the sensuous and the intelligible, "com[ing] to show themselves upon the earth and beneath the sky, entrusting their secret to imagination alone" (2000, 25). These subjects present possible areas of further interdisciplinary research at the intersections of photography and disciplines such as philosophy, geography, cultural studies, studies of perception or branches of environmental social sciences; or indeed in the rapidly expanding multidisciplinary field that arises from the growing ability to think beyond the exclusively human and manifests in the recent advent of environmental philosophy and post-human theory. The work indicates a method of addressing these issues in a practice-led enquiry, and a way of communicating the findings through means other than written language.

Moreover, I investigated how the experience of an index is shaped by other signs that surround it, examining the issue through the prism of the process of fine-tuning the installation of the work produced in this project. As indices, photographs testify to the event of exposure having taken place, but do not necessarily reveal anything about the nature of the referent. They rely on conventional signs to denote the latter – most often the image. Yet, as I have discovered by exhibiting the work at different stages of the project, it is in the absence of the image, at the moment when pure indexicality is encountered in the form of unfamiliar objects that appear upon opening the boxes with my pieces, that photographs pry a gap in a system of conventional signs that are ‘read’, involuntarily, every second (from a gallery space designating an object as an artwork to an image designating its subject). Simultaneously, the objects are interpreted based on the connotations carried by other elements of the installation, such as the construction of the boxes, the size and shape of the table, or even the level of interaction asked of the viewers. If the sensuous apprehension of the pieces, evoking a feeling of illegibility of an index and inability to grasp its referent, was the prime concern, than the installation could exclude other elements necessary to indicate the indexical and photographic character of the objects. However, the embodied encounter is in my work a vehicle for conceptual understanding: firstly, of the way a photograph functions as a pure index and secondly, of the wider implications of producing photographs in this way. (Viewers’ experience mirrors therefore my own approach as a maker, where the conceptual base retains priority over sensuous aspects of the work.) Hence the important role of the technical information placed on a label and the film showing my interaction with the environment while making the photographs. In combination with the initial encounter of pure indexicality, interpretation of these iconic and symbolic signs leads viewers to complete the act of representation through active participation of their imaginations.

The inclusion of the film in the final installation is significant also because it exemplifies in my work an image in its apparently dematerialized form. Moving between the table with the boxes containing the photographs and the projection of the film, viewers’ role changes between that of active participants in the making of the work and spectators allowing the immersive experience of the film to transport them into the time and space of making the photographs. Yet beyond being immediately perceived as signifying iconically, the film is as ambiguous in its indexical relation to the objects as they are in relation to the places they represent. The installation explores therefore both conventionalised relationships present between such elements as labels or boxes and the photographs, and connections that need to be inferred - such as that between the film and the objects, which, like all indexical relationships, is always at risk of failing to signify.

This investigation of indexicality – a term that has been used in writings on photography since the 1960s to effectively define the relationship of photographs to the world - conducted primarily from a practice-led rather than a theoretical perspective, has a potential to contribute to the subject of indexicality within photography theory, as well as within semiotics. It could also enrich the understanding and use of photography in those disciplines that rely on topographical images as documentary evidence, such as geography, geology, or anthropology. Moreover, the study of semiotic relations and the meaning-making process in response to the work might well be of interest to art practitioners working not only with more traditional forms of photography, but also in altogether different media. It is perhaps from the extreme point of image-less photography reached by this work, and taking into consideration the findings of the journey, that the image, with all of its potency, can be returned back into the physical dimension of the embodied photographer participating in the sensuous world and the viewers who, through their physical and intellectual presence, create the photograph. In judging whether the work has brought me any closer to representing the elemental, perhaps the criteria proposed by David Abram when he writes about language are most appropriate:

> If they do not aim at a static or 'literal' reality, how can we discern whether one telling of events is any better or more worthy than another? The answer is this: a story must be judged according to whether it *makes sense.* And 'making sense' must here be understood in its most direct meaning: to make sense is *to enliven the senses*. A story that makes sense is one that stirs the senses from their slumber, one that opens the eyes and the ears to their real surroundings, tuning the tongue to the actual tastes in the air and sending chills of recognition along the surface of the skin. To *make sense* is to release the body from the constrains imposed by outworn ways of speaking, and hence to renew and rejuvenate one's felt awareness of the world. It is to make the senses wake up to where they are. (1997, 265)

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Taking Photographs Beyond the Visual: Paper as a Material Signifier in Photographic Indexicality

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PhD

Volume 2 of 2

2014

Taking Photographs Beyond the Visual: Paper as a Material Signifier in Photographic Indexicality

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A thesis submitted in partial fulfilment of
the requirements of the University of
Northumbria at Newcastle for the degree
of Doctor of Philosophy

Research undertaken in the School of
Arts, Design and Social Sciences

Volume 2 of 2

March 2014

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Appendix 1. First experiments with historic direct positive photographic processes (Newcastle, Apr – May 2011)

Legend for colours used in the text throughout the appendices:
Blue – actions experimented with
Red – actions later discovered to be wrong
Green – actions later discovered to be correct

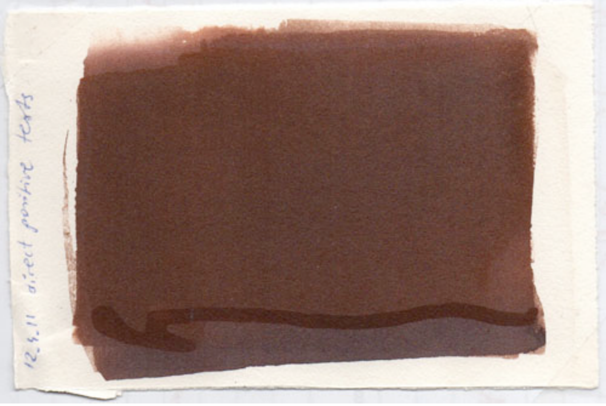
All exposures in a 5x4 camera through a window.

Dr Keith's dry wax method (Jennings & Lundgren 2002) for obtaining paper negatives (calotype)
Paper used: Japanese sumi-e paper in a roll

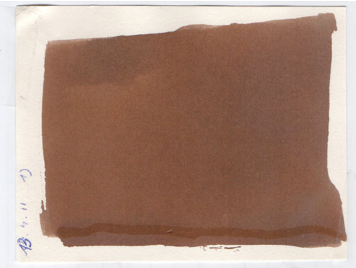
Waxing 11.4.2011	Paper cut to size (smaller than 4x5 inches); aluminium plate placed on an iron (on low 'nylon' setting) and when sufficiently heated ('which is when water dropped upon it boils without running off', dr Keith quoted in Jennings & Lundgren 2002), each sheet of paper placed over it and rubbed with natural yellow beeswax; each sheet ironed between paper kitchen towels used as blotting tissue to remove excess wax.		
Sensitizing 11.4.2011	Iodiser	Potassium iodide 23g + lactose 43g + potassium bromide 8g + sodium chloride 2.6g (should have been 1.3g) 500ml distilled water	Sheets immersed in a stack for 1 hour
	Dry	Hanging	
	Aceto-nitrate	6.6g silver nitrate + 100ml distilled water + 8.8g acetic acid	12 min bath; inserted sheet by sheet in 30s intervals to form a stack in the tray, stack flipped and sheets taken out in same intervals
	Water	Distilled water	12 min bath + 10 min fresh bath; method as above
	Blotted	In kitchen towels, followed by pressing between kitchen towels [this has left a pattern of the towels on the papers] and two boards of a clip frame	Left overnight

Exposures 12.4.2011			10-11am, sunny with some clouds
		5 min	Large format camera, f4.7 (?); some detail visible
		10 min	Large format camera, f4.7 (?); some detail visible
		15 min	Large format camera, f4.7 (?); some detail visible
	Developer	Ferrous sulphate 10g in 300-400ml water (hasn't dissolved completely)	
	Fixer	Sodium thiosulphate	
	Water		
Exposure 1 14.4.2011	40 min		1:20-2pm, cloudy; large format camera, f4.7; some detail visible
	Developers	0.4% solution of gallic acid	10min
		As above + a few drops of dr Diamond's aceto-nitrate (Wright 2011): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	10min
		0.4% solution of gallic acid	10min
		Gallo-nitrate full	

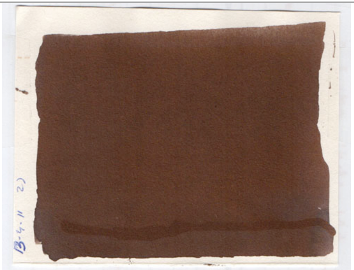
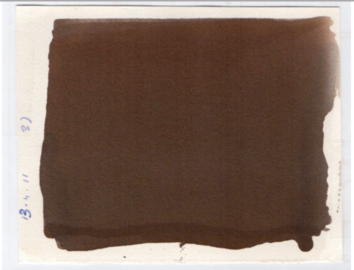
		strength = gallic acid saturated solution + aceto-nitrate in 1:1.5 or 1:2 proportion (Talbot's recipe)	
	Fixer	Sodium thiosulphate	
	Water		
Exposure 2 14.4.2011	40 min	(also mistakenly exposed in an open darkslide for a few seconds)	2:20-3pm, cloudy; large format camera, f4.7; some detail visible
	Developers	0.4% solution of gallic acid	10min
		As above + a few drops of dr Diamond's aceto-nitrate (Wright 2011): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	10min
		0.4% solution of gallic acid	10min
		Gallo-nitrate full strength = gallic acid saturated solution + aceto-nitrate in 1:1.5 or 1:2 proportion (Talbot's recipe)	
	Fixer	Sodium thiosulphate	
	Water		
Exposure 3 14.4.11	Overnight		6pm – 12pm the next day; cloudy
	Developer	0.8% solution of gallic acid; later a few drops of aceto-nitrate added	Exposed to steam from an iron during development
Robert Hunt's unclear instructions (Hunt 1844) for obtaining direct positive images **Paper used: previously salted watercolour papers**			
Sensitizing 12.4.2011	Silver nitrate	12% (?) with 6% citric acid – as used for salt	Coated with glass rod

		prints	
	Pre-exposure	Immediately dried and darkened in sunshine	
	Potassium iodide	1) 5% 2) stronger	
	Dry		
Exposures	5 – 10min	Sunny with some clouds	Large format camera, f4.7 (?)
			

Bayard's recipe as given by Robert Hunt (Hunt 1844) for obtaining direct positive images
Paper used: previously salted watercolour papers

Sensitizing 13.4.2011	Silver nitrate	12% with 6% citric acid (?) – as used for salt prints	Coated with glass rod
	Pre-exposure	Immediately dried and darkened in sunshine on a window sill for 10-20min	10-12am, rather cloudy too long?
Exposure 1 	Potassium iodide	4%	Immersed for 10-20s
	Exposure	Sandwiched between acetate in darkslide	10min Large format camera, f4.7
	Water		
	Fixer	15% sodium thiosulphate	
	Water		

Exposure 2	Potassium iodide	4%	Immersed for 10-20s
	Exposure	Sandwiched between acetate in darkslide	30-45min Large format camera, f4.7
	Water		
	Fixer	15% sodium thiosulphate	

	Water		
Exposure 3	Water	Distilled water	
	Dry	Heat drier	
	Potassium iodide	4%	7 min
	Exposure	Sandwiched between acetate in darkslide	15 min Large format camera, f4.7
	Water		
	Fixer	15% sodium thiosulphate	
	Water		
Exposure 4	Water	Distilled water with some sea salt	
	Dry	Heat drier	
	Potassium iodide	4%	5 min
	Exposure	Without acetate	1.5 h Large format camera, f4.7; horizon slightly visible
	Water		
	Fixer	15% sodium thiosulphate	
	Water		
Exposure 5	Water	Distilled water with some sea salt	
	Dry	Heat drier	
	Potassium iodide	4%	5 min
	Exposure	Without acetate, with piece of paper towel as backing to keep moisture	0.5 h Large format camera, f4.7; horizon slightly visible
	Water		
	Fixer	15% sodium thiosulphate	
	Water		
Exposures	5 – 10min	Sunny with some clouds	Large format camera, f4.7 (?)

Talbot's leucotype method (Osterman 2005a) for obtaining direct positive images, using dr Diamond's aceto-nitrate recipe (Wright 2011)
Paper used: Japanese sumi-e paper waxed and iodised according to dr Keith's recipe as above (Jennings & Lundgren 2002)

14.4.2011 1)	Gallo-nitrate diluted 6 - 18times	Dr Diamond's aceto-nitrate (Wright 2011: 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid) + gallic acid (1g to 50ml)	5min
	Pre-exposure	Wet, in sunlight	2-3min; browned very quickly too long?
	Water	Distilled water	5-10min
	Dry	Hanging, later hot air drier	
	Potassium iodide	4% (?)	5min
	Exposure	With blotter backing the paper in the darkslide to retain moisture	3:10-3:45 (35min); large format camera, f4.7; clear horizon image visible upon taking out of the camera
	Developer	Gallo-nitrate full strength = gallic acid saturated solution + aceto-nitrate in 1:1.5 or 1:2 proportion (Talbot's recipe)	Solution darkened quickly
	Water		
	Fixer	Sodium thiosulphate	
	Water		
14.4.2011 2) thicker paper with inclusions waxed and iodised according to dr Keith's recipe as above 	Gallo-nitrate diluted 6 - 18times	Dr Diamond's aceto-nitrate (Wright 2011: 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid) + gallic acid (1g to 50ml)	5min
	Pre-exposure	Wet, in sunlight	2-3min; browned in patches, so back into…

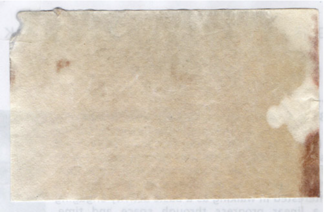
	Gallo-nitrate diluted 6 – 18x	As above, later replenished	
	Pre-exposure	Wet, in sunlight	Darkened more or less evenly
	Dry	Hot air drier	
	Potassium iodide	4% (?)	2min
	Exposure		4:10-3:40 (30min); large format camera, f4.7; no image (not enough exposure time?)
	Developer	Gallo-nitrate full strength = gallic acid saturated solution + aceto-nitrate in 1 : 1.5 or 1:2 proportion	Solution darkened quickly
	Water		
	Fixer	Sodium thiosulphate	
	Water		

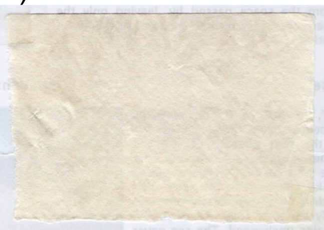
Robert Hunt's chromatype method (Hunt 1854) for obtaining direct positive images
Paper used: Japanese sumi-e paper waxed and iodised according to dr Keith's recipe as above (Jennings & Lundgren 2002)

15.4.2011	Sensitizing	3.9g sulphate of copper + 30ml water + 15ml saturated solution of potassium bichromate	Brushed (?)
	Dry		
1)	Exposure		12-2pm, very cloudy
	Developer	Silver nitrate 8% solution distilled 10x	
	Water	Distilled water	2 baths, 5 min each
2)	Exposure		3:30-11am the next day
	Developer	Silver nitrate 8% solution distilled 10x	
	Water	Distilled water	2 baths, 5 min each
	Some image visible (diagonal roof edge on the top left)		
Chromatype only suitable for contact printing (Hunt suggests so himself; Hunt 1844).			

Talbot's leucotype method (Osterman 2005a) for obtaining direct positive images mixed with Bayard's recipe (Passafiume 2001), using dr Diamond's aceto-nitrate recipe (Wright 2011)
Paper used: paper with inclusions and Japanese sumi-e paper waxed and

iodised according to dr Keith's recipe as above (Jennings & Lundgren 2002)			
18.4.2011	Gallo-nitrate diluted 4x	Dr Diamond's aceto-nitrate (Wright 2011: 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid) + a few drops of gallic acid	1) 1min 2) 5min 3) 10min
	Pre-exposure	In daylight	1min (2) browned more than others)
	Water	With salt	
	Dry	In heat drier	
	Potassium iodide	4%	A few min
	Dry	In heat drier	
Exposures			
1) 			11:30-12:30, light clouds
2) 			12:30-1:30pm
3) 			5:40pm-8:30am the next morning
	Developer	Gallic acid	Overnight
	Gallo-nitrate diluted 18x	Dr Diamond's aceto-nitrate (Wright 2011: 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid) + a few drops of gallic acid	10min
	Pre-exposure		Only until slightly darkened
	Water	With salt	5min
	Water		5min

4) 	Dry		
	Potassium iodide	4%	5min
	Exposure	Wet with blotter backing the paper to retain moisture	1:30-2:30pm
	Developer	Gallic acid	Overnight

5) 	Pre-exposure	In daylight, dry	Darkened very little – not re-sensitized with gallo-nitrate as the ones above
	Potassium iodide	4%	Double bath with drying in-between
	Exposure	Wet with blotter backing the paper to retain moisture	2:50-5:40pm, cloudy
	Developer	Gallic acid	Overnight
19.4.2011 6) 	Gallo-nitrate diluted 4x	Dr Diamond's aceto-nitrate (Wright 2011: 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid) + a few drops of gallic acid	10min
	Pre-exposure	In daylight	Short
	Water	With salt	
	Water		
	Dry	In heat drier	
	Potassium iodide	4%	5min
	Dry	In heat drier	
	Exposure		6pm-9am the next morning
	Developer	Gallic acid (?)	

Talbot's leucotype method (Osterman 2005a) for obtaining direct positive images mixed with Bayard's recipe for obtaining waxed negatives (Passafiume 2001) using dr Keith's aceto-nitrate recipe (Jennings & Lundgren 2002)
Paper used: Japanese sumi-e paper waxed and iodised according to dr Keith's recipe as above (Jennings & Lundgren 2002)

	Aceto-nitrate	Dr Keith's recipe (6.6g silver nitrate + 100ml distilled water + 8.8g acetic acid)	10min Adding gallic acid to aceto-nitrate previously as per dr Diamond's recipe didn't work?
	Pre-exposure		5min, turned grey
	Water	With salt	

2) 	Water2		
	Dry	In heat drier	
	Potassium iodide	4%	5min
	Dry	In heat drier	
	Exposure		11:20-12:40
	Developer	Gallic acid (?)	
3) 	Aceto-nitrate	Dr Keith's recipe (6.6g silver nitrate + 100ml distilled water + 8.8g acetic acid) + gallic acid (saturated solution?) in 2:1 or 3:1 proportion	10min
	Pre-exposure		1min, some brown darkening
	Water	With salt	
	Water		
	Dry	In heat drier	
	Potassium iodide	4%	5min
	Dry	In heat drier	
	Exposure		12:40-4:50pm
	Developer	Gallic acid (?)	

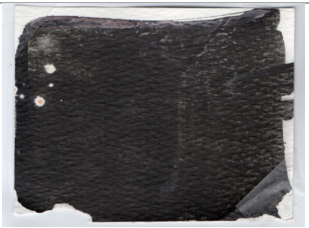
Liquid emulsion (SE1) reversal into positive image (using iodine)
Paper used: various papers

19.4.2011	Liquid emulsion	Brushed onto paper, dried	
 1)  2)  3)	Exposure	1) 1s, f 4.7, 10:20 2) 1s, f 11, 11:20 3) 1s, f 16, 11:20 4) 1s, f 11, 12:20 5) 1s, f 16, 12:20 6) 1s, f 8, 16:50 7) 1s, f 11, 16:50	Large format camera
	Developer	Dokumol diluted 1:6 – 1:8	
	Water	Brief wash	
	Bleach	Potassium bromide 11.5g + iodine 2.3g (didn't dissolve completely) + 100ml water	1 – 3) ? min 4) 8min 5) 20 min 6) 17 min 7) 10 min
	Water	Brief wash	
4) [disintegrated?] 5) [disintegrated?]	Developer		1 – 3) 30s 4 – 5) 1min20s 6) 1min (4–6) in dev. until

 6)  7)			clear image visible) 7) 30s (before clear image visible)
	Re-exposure	In daylight	~1min or until image formed
	Water		5 min

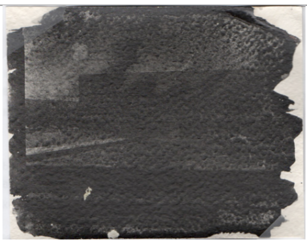
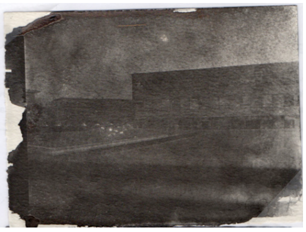
Liquid emulsion (SE1) reversal into positive image (using Foma reversal kit)
Paper used: various papers

20.4.2011 morning	Liquid emulsion	Brushed onto paper, dried	
 1)  2)  3)  4)  5)	Exposure	1) 1s, f 11, 11:20 2) 1s, f 11, 11:20 3) 1s, f 16, 11:20 4) 1s, f 16, 11:20 5) 1s, f 8, 13:40 6) 1s, f 11, 13:40 7) 1s, f 16, 13:40 8) 1s, f 22, 13:40	Large format camera
	Developer	Dokumol diluted 1:6 – 1:8	1) 1min 2) 1min 3) 45s 4) 1min 5) 2min 6) 2min 7) 2min 8) 2min
	Bleach	(Foma reversal kit)	8min
	Water		2min
	Cleaning bath		3min
	Water		2min
	Re-exposure	1-2) 2min, until violet and slight image visible 3-4) until very slight image visible, but no colour too long?	
	Developer	Dokumol diluted 1:6 – 1:8	1.5min
	Water		

 6)  7)  8)	Fixer		
	Water		

Liquid emulsion (SE1) reversal into positive image (potassium dichromate and sulphuric acid)
Paper used: various papers

20.4.2011 afernoon	Liquid emulsion	Brushed onto paper, dried	
 1)  2)  3)  4)	Exposure	1) 2-3s, f 16 2) 1s, f 16 3) 1s, f 22 4) 1s, f 22 5) 1s, f 11 6) 1s, f 11 7) 1s, f 4.7 8) 1s, f 4.7	Large format camera
	Developer	Dokumol diluted 1:6 – 1:8	1) 6min 2) 6min 3) 5min 4) 5min 5) 5min 6) 5min 7) 2-3min 8) 2-3min
	Bleach	(5g potassium dichromate + 250ml water) + (5ml sulphuric acid + 250ml water)	? min
	Water		? min
	Cleaning bath	10g sodium sulphite + 250ml water	3min
	Water		2min
	Re-exposure	1) 30s	Less strong light in

5)  6)  7)  8) 		2) 40s 3) 1min 4) 30s 5) 30s 6) 1min 7) 30s 8) 10s	the re-exposure area than in the morning when previous batch has been done
	Developer	Dokumol diluted 1:6 – 1:8	1) 3.5min 2) 2min 3) 2min 4) ? min 5) 1.5min 6) 1min 7) 1min 8) 1min
	Water		
	Fixer		
	Water		

Talbot's leucotype method (Osterman 2005a) for obtaining direct positive images using paper for dr Keith's waxed negatives (Jennings & Lundgren 2002) Paper used: Japanese sumi-e paper waxed and iodised according to dr Keith's recipe as above

3.5.2011 1) 	Gallo-nitrate or just aceto-nitrate, diluted (?)	Dr Diamond's aceto-nitrate ((Wright 2011): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid) + a few drops of gallic acid (or without gallic acid)	~5min
	Pre-exposure	In daylight	
	Water	With salt	
	Water		
	Dry	In heat drier	
	Potassium iodide	4%	~5min
	Water		
	Dry	In heat drier	
	Exposure	10:49-11:04 (15min), some clouds	Large format camera, f 4.7 (?)

	Developer	Dokumol 1+9 (?)	

2) 	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid, fresh	5min paper left the aceto-nitrate bath milky
	Pre-exposure	In daylight	
	Water	With salt	5min
	Water		5min
	Dry	In heat drier	
	Potassium iodide	4%	5min
	Water		
	Dry	In heat drier	
	Exposure	2:30-2:55 pm (25min), some clouds	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+9 (?)	
3) 	Silver nitrate		Applied with glass rod
	Water	Floated	10min
	Dry		
	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	5min bath milky from previous sheet
	Pre-exposure	In daylight	
	Water	With salt	5min
	Water		5min
	Dry	In heat drier	
	Potassium iodide	4%	5min
	Water		
	Dry	In heat drier	
	Exposure	3:18-3:38 pm (20min), some clouds	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+9	20min

Talbot's leucotype method (Osterman 2005a, Croucher 1853) for obtaining direct positive images
Paper used: various papers

3.5.2011	Silver nitrate	12%?	Applied with glass rod, dried
	Potassium iodide	7% with salt 1.5%	Floated, a few min
	Dry	(Partly dry)	

1) 	Water	Floated	15min
	Dry		
	Aceto-nitrate	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	Applied with glass rod
	Pre-exposure	In sun a few min	Turned slightly brown-green
	Water	With salt	5min
	Water		5min
	Dry		
	Potassium iodide	7% (?) with salt 1.5% (?)	5min
	Water		5min
	Exposure	1:06-1:26pm (20min) sunny	Large format camera, f 4.7 (?); image printed out
	Developer	Dokumol 1+9	2min, no change in image density
2) 	Silver nitrate	12%?	Applied with glass rod, dried
	Potassium iodide	7% with salt 1.5%	Floated, 2min
	Dry	(Partly dry)	
	Water	Floated	1h
	Dry		
	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	10min bath
	Pre-exposure	In sun a few min	
	Water	With salt	5min
	Water		5min
	Dry		
	Potassium iodide	7% (?) with salt 1.5% (?)	5min
	Water		5min
	Exposure	1:46-2:06pm (20min) slightly cloudy	Large format camera, f 4.7 (?); image printed out
	Developer	Dokumol 1+9	10min, tone intensified
	Silver nitrate	12%?	Applied with glass rod
	Potassium iodide	7% with salt 1.5%	Floated, 2 min
	Dry	(Partly dry)	

3) 	Water	Floated	10min
	Dry		
	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	5 min bath
	Pre-exposure	In sun a few min	Turned pink-violet
	Water	With salt	5min
	Water		More than 5min
	Dry		
	Potassium iodide	7% (?) with salt 1.5% (?)	5min
	Water		5min
	Exposure	3:39-4:00pm (21min)	Large format camera, f 4.7 (?); image printed out slightly
	Developer	Dokumol 1+9	? min
4) 	Silver nitrate	12%?	Applied with glass rod
	Potassium iodide	7% with salt 1.5%	Floated, 1 min
	Dry	(Partly dry)	
	Water	Floated	10min
	Dry		
	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	5 min bath
	Pre-exposure	In sun a few min	Turned blue
	Water	With salt	5min
	Water		5min
	Dry		
	Potassium iodide	7% (?) with salt 1.5% (?)	25min
	Water		5min
	Exposure	2:57-3:17pm (20min)	Large format camera, f 4.7 (?); image printed out slightly
	Developer	Dokumol 1+9	10 min
4.5.2011 (5, 7, 13) on 9.5.2011)	Silver nitrate	12%?	Applied with glass rod
	Potassium iodide	7% with salt 1.5% (fresh)	Less than 1 min
	Dry	(Partly dry)	
	Water	5, 14) Tap water	Floated,


5)


6)

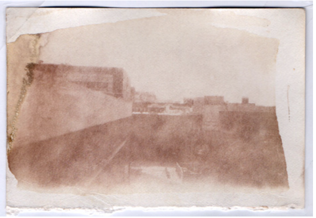

7)


8)

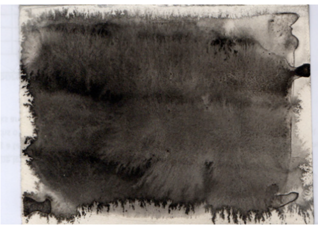

9)


10)

	6-10) distilled water	5, 14) 30min 6-10) 10min
Dry		
Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid	10-15min
Pre-exposure	In sun a few min 5, 7, 13) 15min	5,12) darkened very quick, smoothly 8, 14) mistake of dipping into water with salt for a brief moment before pre-exposure – darkened unevenly
Water	With salt (this step omitted in 5, 7, 13))	5-10min
Water	(5, 7, 13) - two baths)	5-10min
Dry		
Potassium iodide	7% with salt 1.5% in distilled water (Greene)	? min 5, 7, 13) 10-15min
Water	Distilled	? min (various?) 5, 7) 10min 6) very long (1.5h) 13) not washed
Exposure	5) 11:03-23am 6) 2:30-50pm 7) 11:53-12:13 8) 1:30-50pm 9) 2:50-3:10pm 10) 3:47-4:00pm 11) 11:35-55am 12) 3:15-35pm 13) 12:15-35pm 14) 4:20-40pm	Large format camera, f 4.7 (?) 7) exposed dry – doesn't work, image as dark before as after exposure
Developer	Dokumol 1+13	5) 1min (darkened too quickly – fresh dev) 6) ? min 7) ? min 8) 1min (darkened overall – fresh dev.) 9) 2min 10) overnight (no image appearing – dev.

11)  12)  13)  14) 			exhausted?) 11) 3min (darkened overall – fresh dev.) 12) ? min 13) 5min 14) overnight (no image appearing – dev. exhausted?)
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		

Liquid emulsion (SE1) reversal into positive image (potassium dichromate and sulphuric acid)
Paper used: various papers

4.5.2011 1)  2)  3) 	Liquid emulsion	brushed onto paper, dried (1-3) and 14-16) emulsion diluted with warm water)	
	Exposure	1) 1s, f 4.7 2) 15s, f 4.7 3) 1s, f 4.7 4) 1s, f 4.7 5) 1s, f 16 6) 1s, f 16 7) 1s, f 32 8) 1s, f 22 9) 1s, f 16 10) 1s, f 16 11) 1s, f 16 12) 1s, f 16 13) 1s, f 16 14) 1s, f 16 15) 1s, f 16 16) 1s, f 16	Large format camera Sunny 1-3) ~11am 4 – 13) ~2pm 14-16) ~2:30pm
	Developer	Dokumol diluted 1:13	1) no image appeared 2) no image appeared

4)


5)


6)


7)


8)


9)

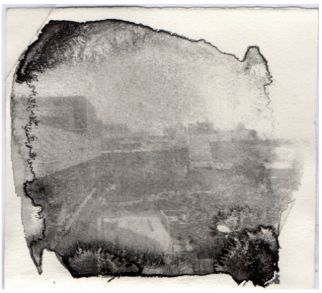

10)


		3) blackened 4) 2min, blackened 5) 1min, image visible 6) as above? 7) 2-3min, little detail in the shadows 8) 2-3min, more detail in the shadows 9) 2-3min? 10) 2-3min? 11) 1.5min 12) ? min 13) ? min 14) ? min 15) ? min 16) ? min
Bleach	(5g potassium dichromate + 250ml water) + (5ml sulphuric acid + 250ml water)	1-3) 2min 4-6) 2.5min 7-9) 3min 10-12) 2.5min 13-16) ? min
Water		More than 2 min
Cleaning bath	10g sodium sulphite + 250ml water	More than 3 min
Water		? min
Re-exposure	1-3) in daylight? 4-7, 10) 0.5m under energy-saving light bulb 8-9, 11-16) 1-1.5m under fluorescent light bulb in corridor	1) ?min 2) ?min 3) ?min 4) 1min 5) 3min 6) 1min 7) 2min 8) 8s 9) 40s 10) 30s 11) 40s 12) 1min 13) 15s 14) 30s 15) 30s 16) 40s
Developer	Dokumol diluted 1:9	Less than 1min
Water		
Fixer	From Foma reversal kit	5-10min
Water		

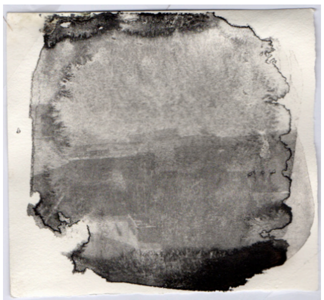
11) 

12) 

13) 

14) 

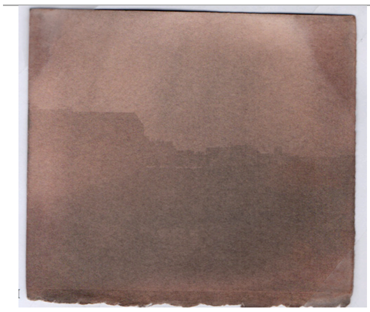
15) 

16) 

Talbot's leucotype method (Osterman 2005a, Croucher 1853), mixed with calotype recipe by Greene (2002) (no silver nitrate application at sensitizing stage!) for obtaining direct positive images
Paper used: various bought for the purpose, including papers recommended by various contemporary authors (Greene, Wright, Jennings & Lundgren)

9.5.2011	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 142)	Immersed in a stack, each sheet for 5-10min
	Dry	Hanging, later in hot air dryer	unnecessary?
	Water	Floated, 15min	
	Dry		
1. Southworth Resume/CV, 90gsm, 100% cotton (recommended in a number of modern manuals)	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 2min
	Pre-exposure	In daylight a few min	Darkened very slowly and unevenly (peppery marks)
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	10min
	Water		Brief
	Exposure	12:37-1:13pm (35min) sunny	Large format camera, f 4.7 (?); pale image visible
	Developer	Gallic acid 0.8% 50min, later Dokumol 1+20	
	Water		
	Fixer	Sodium	

		thiosulphite 12.5%	
	Water		
2. Fabriano Artistico, HP, 300gsm, 100% cotton, acid free	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min
	Pre-exposure	In daylight a few min	Darkened very slowly, turned purple
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	5min
	Water		Dipped
	Exposure	1:26-1:46pm (20min) sunny	Large format camera, f 4.7 (?)
	Developer	Gallic acid 0.8%	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
3. Canson Montval, 300gsm, acid free, wood free (but not 100% cotton), internally sized	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min
	Pre-exposure	In daylight a few min	Darkened very slowly
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	10min
	Water		Dipped
	Exposure	1:55-12:15pm (20min) sunny	Large format camera, f 4.7 (?); pale image visible
	Developer	Dokumol 1+20	no change in image density
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
4. Canson Fontenay, 300gsm, two-sided: NOT and rough, 100% cotton, acid free, surface sized	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min

	Pre-exposure	5 min	Darkened very slowly
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	15min
	Water		4min
	Exposure	2:16-2:46pm (20min) sunny	Large format camera, f 4.7 (?); pale image visible, but dark overall
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
5. Windsor&Newton, cartridge	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min
	Pre-exposure	In daylight a few min	Darkened very slowly, in patches
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	10min
	Water		10min
	Exposure	2:58-3:18pm (20min) sunny	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
6. Tracing paper	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min
	Pre-exposure	In daylight a few min	Darkened very slowly
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	20min
	Water		5min
	Exposure	2:38-2:58pm (20min) sunny	Large format camera, f 4.7 (?)

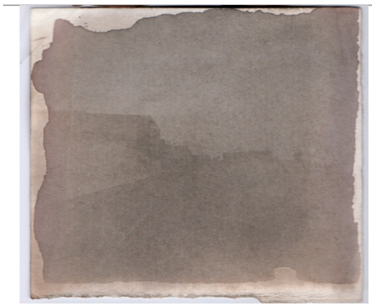
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
7. Cotman, Windsor&Newton, 190gsm, HP, acid free, wood free (but not 100% cotton), internally and externally sized	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min
	Pre-exposure	In daylight a few min	Darkened very slowly
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	10min
	Water		10min
	Exposure	15min sunny	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		

Talbot's leucotype method (Osterman 2005a), mixed with Talbot's calotype recipe after Sparling (1856) for obtaining direct positive images
Paper used: various bought for the purpose, including papers recommended by various contemporary authors (Greene, Wright, Jennings & Lundgren)

9.5.2011	Silver nitrate	4%	Applied to all with glass rod
	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 142)	Floated 3min
	Dry	Hanging, until half dry	unnecessary?
	Water	Floated	3h
	Dry	Flat	
1. Cotman, Windsor&Newton, 190gsm, HP, acid free, wood free (but not 100% cotton), internally and externally sized	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min, curled (edges not immersed as long)
	Pre-exposure	In daylight a few min	Browned very slightly; parts that were immersed in aceto-nitrate for a

			shorter time darkened more -> bath should be shorter?
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	5min
	Water		5min
	Exposure	10:33-10:53pm (20min) mostly overcast	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20 (fresh)	5min
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
2. Tracing paper	Aceto-nitrate	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Immersed 1min
	Pre-exposure	In daylight a few min	No darkening
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	5min
	Water		5min
	Exposure	11:30-12:15pm (45min) mostly overcast	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20	5min, print completely dark
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
3. Langton Prestige, 300gsm, HP, 100% cotton, acid free	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water +	Immersed 10min

		2g silver nitrate + 3.5ml acetic acid, old solution	
	Pre-exposure	In daylight a few min	Turned light brown
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	5min
	Water		5min
	Exposure	11:00-11:30pm (30min) mostly overcast	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20	5min, no contrast
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
4. Southworth Resume/CV, 90gsm, 100% cotton (recommended in a number of modern manuals)	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid, old solution	Immersed 40min
	Pre-exposure	In daylight a few min	Turned light violet
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	Longer than 5 min
	Water		5min
	Exposure	12:20-12:40pm (20min) mostly overcast	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20	5min
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
5. Whatman, 190gsm, NOT, 100% cotton, acid free (now discontinued, replaced by Millford paper by St Cumbert Mill)	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid, old solution	Immersed 40min
	Pre-exposure	In daylight a few min	Turned mid-violet
	Water	Two baths	? min
	Dry	In hot air dryer	

	Potassium iodide	As in iodising stage, fresh	10 min
	Water		10 min
	Exposure	1:04-1:29pm (25min) mostly overcast	Large format camera, f 4.7 (?)
	Developer	Dokumol 1+20	5min
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
6. Canson Fontenay, 300gsm, two-sided: NOT and rough, 100% cotton, acid free, surface sized	Aceto-nitrate, diluted 18x	260ml distilled water + 29.7g silver nitrate (=11.4%) + 65ml acetic acid (Greene, 152)	Floated 5min
	Pre-exposure	In daylight a few min	Turned very slightly yellow
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage, fresh	5 min
	Water		5 min
	Exposure	12:43-1:03pm (20min) mostly overcast	Large format camera, f 4.7 (?); no image visible
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
7. Fabriano Artistico, HP, 300gsm, 100% cotton, acid free	Aceto-nitrate, diluted 18x	Talbot’s aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid, old solution	Immersed 1h
	Pre-exposure	In daylight a few min	Turned murky brown
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage, fresh	10 min
	Water		10 min
	Exposure	1:30-1:50pm (20min) mostly overcast	Large format camera, f 4.7 (?); no image visible
	Developer	Dokumol 1+20	
	Water		

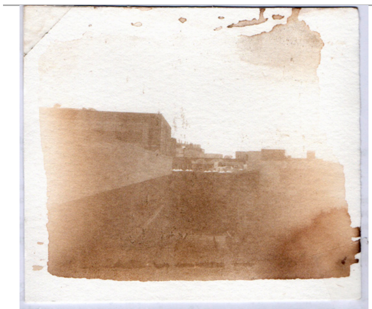
	Fixer	Sodium thiosulphite 12.5%	
	Water		
8. Canson Montval, 300gsm, acid free, wood free (but not 100% cotton), internally sized	Aceto-nitrate, diluted 18x	Talbot's aceto-nitrate (Croucher 1853): 30ml distilled water + 2g silver nitrate + 3.5ml acetic acid, old solution	Immersed 1h
	Pre-exposure	In daylight a few min	Turned slighly brown
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage, fresh	10 min
	Water		10 min
	Exposure	1:50-2:10pm (20min) mostly overcast	Large format camera, f 4.7 (?); no image visible
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		

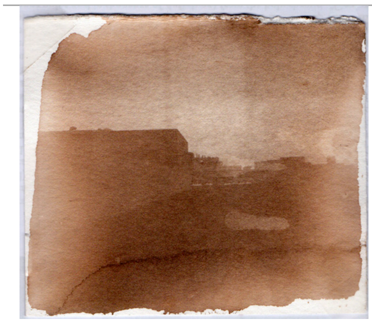
Talbot's leucotype method (Osterman 2005a), mixed with Talbot's calotype recipe after Sparling (1856) for obtaining direct positive images
Paper used: various bought for the purpose, including papers recommended by contemporary authors (Greene, Wright, Jennings & Lundgren)

12.5.2011	Silver nitrate	4%	Applied with glass rod, dried
1. Southworth Resume/CV, 90gsm, 100% cotton (recommended in a number of modern manuals)	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 142)	Floated 1min, and laid flat for 1-3min
	Water	Floated	3h
	Dry	Warm air dryer	
	Aceto-nitrate, diluted 18x	4% silver nitrate solution + acetic acid (roughly estimated volume), diluted 18x, fresh	Immersed 5min
	Pre-exposure	In daylight a few min	Until medium brown
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium	As in iodising	10min

	iodide	stage	
	Water		5min
	Exposure	2:14-2:34pm (20min)	Large format camera, f 4.7 (?); image visible
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
2. Southworth Resume/CV, 90gsm, 100% cotton (recommended in a number of modern manuals)	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 142)	immersed ?min, and laid flat for 1-3min
	Water	Floated	3h
	Dry	Warm air dryer	
	Aceto-nitrate, diluted 18x	4% silver nitrate solution + acetic acid (roughly estimated volume), diluted 18x, fresh	Immersed 5min
	Pre-exposure	In daylight a few min	Until medium brown; this less patchy than the one above, floated on pot.iod.
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	10min
	Water		5min
	Exposure	2:38-3:10pm (32min)	Large format camera, f 4.7 (?); image visible
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		
3. Dr Keith's dry waxed and iodised Japanese sumi-e paper	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 2002: 142)	immersed ?min, and laid flat for 1-3min
	Water	Floated	3h
	Dry	Warm air dryer	
	Aceto-nitrate,	4% silver nitrate	Immersed 10min

	diluted 18x	solution + acetic acid (roughly estimated volume), diluted 18x, fresh	
	Pre-exposure	In daylight a few min	Patchy – paper still greasy – uneven absorption
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	15min
	Water		10min
	Exposure	3:10-3:30pm (20min)	Large format camera, f 4.7 (?), no image
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		

4. Canson Fontenay, 300gsm, two-sided: NOT and rough, 100% cotton, acid free, surface sized	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 2002: 142)	Floated 1min, and laid flat for 1-3min
	Water	Floated	3h
	Dry	Warm air dryer	
	Aceto-nitrate, diluted 18x	4% silver nitrate solution + acetic acid (roughly estimated volume), diluted 18x, fresh	Immersed 5min
	Pre-exposure	In daylight a few min	Darkened quickly
	Water	Two baths	? min
	Dry	In hot air dryer	Darker after drying than the one below, immersed in pot.iod.
	Potassium iodide	As in iodising stage	10min
	Water		2min
	Exposure	3:52-4:12pm (20min)	Large format camera, f 4.7 (?); image visible
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite	

		12.5%	
	Water		
5. Canson Fontenay, 300gsm, two-sided: NOT and rough, 100% cotton, acid free, surface sized	Potassium iodide	4% with potassium bromide (1.1%) and salt (0.5%) (Greene, 2002: 142)	Immersed ?min, and laid flat for 1-3min
	Water	Floated	3h
	Dry	Warm air dryer	
	Aceto-nitrate, diluted 18x	4% silver nitrate solution + acetic acid (roughly estimated volume), diluted 18x, fresh	Immersed 5min
	Pre-exposure	In daylight a few min	Darkened quickly
	Water	Two baths	? min
	Dry	In hot air dryer	
	Potassium iodide	As in iodising stage	10min
	Water		2min
	Exposure	3:31-3:51pm (20min)	Large format camera, f 4.7 (?); image visible
	Developer	Dokumol 1+20	
	Water		
	Fixer	Sodium thiosulphite 12.5%	
	Water		

Appendix 2. Establishing two working historic direct positive photographic processes: Talbot’s developing-out process and Bayard’s printing-out process (Nairs, Switzerland, May - Jun 2011)

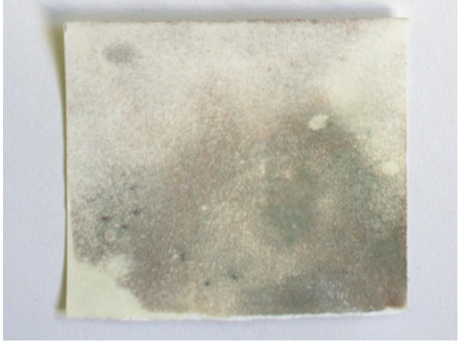
Talbot’s developing-out process (Greene 2002, Osterman 2005a, Sparling 1856):

01. Southworth CV A4	Silver nitrate	6%	Sprayed
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula (pot.iod.4% + pot.brom. 1% + sod.chlor. 0.5%)	Sprayed
	Water	10 min	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	
	Water	5-10 min	
	Dry	Overnight	Hanging
	Potassium iodide	Greene III formula	5 min
	Exposure **27.5.11**	9:30 – 13:30	
	Developer	Dokumol	
	Fixer		
	Water		
02. Southworth CV A4	Silver nitrate	6%	Sprayed
Changing bag camera with 58 mm +4 magnifying lens + aperture	Potassium iodide	Greene III formula	Sprayed
	Water	-	
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	
	Water	5-10 min	
	Dry	Overnight	Hanging
	Potassium iodide	Greene III formula	5 min
	Water	5 min	
	Exposure **19.5.11**	9:00 – 10:00 clear sky	By the river

	Developer	Dokumol 1+10	
	Fixer		
	Water		
03. Southworth CV A4	Silver nitrate	6%	Sprayed
Changing bag camera with 58 mm +4 magnifying lens + aperture	Potassium iodide	Greene III formula	Sprayed
	Water	10 min	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	
	Water	5-10 min	
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	5 min
	Water	5 min	
	Exposure **19.5.11 ?**		
	Developer	Dokumol	
	Fixer		
	Water		
04. Southworth CV A4	Silver nitrate	6%	Brushed
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	Sprayed
	Water	10 min	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	
	Water	5-10 min	
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	5 min
	Water	5 min	
	Exposure **19.5.11**	10:28 – 12:28 clear sky	Studio window
	Developer	Dokumol 1+10	
	Fixer		
	Water		
05. Southworth CV A4	Silver nitrate	6%	Brushed
Changing bag camera with	Potassium	Greene III formula	Sprayed

65 mm magnifying glass lens	iodide		
	Water	10 min	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	
	Water	5-10 min	
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	2 min
	Exposure **25.5.11**	15:20 – 17:30	Studio window; no image, patchy
	Developer	Dokumol	Image visible
	Fixer		
	Water		
06. Southworth CV A4	Silver nitrate	6%	Glass rod
Changing bag camera with 58 mm +4 magnifying lens + aperture	Potassium iodide	Greene III formula	1 min +hung for 2 min
	Water	1 h	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	A few min immersed
	Pre-exp.	? min	mid-brown
	Water	A few min	
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	5 min
	Water	1 min	
	Exposure **20.5.11**	9:37 – 11:00 sunny	studio window
	Developer	Dokumol	
	Fixer		
	Water		
07. Southworth CV A4	Silver nitrate	6%	Glass rod
Changing bag camera with 58 mm +4 magnifying lens + aperture	Potassium iodide	Greene III formula	1 min +hung for 2 min
	Water	1h	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic	A few min immersed

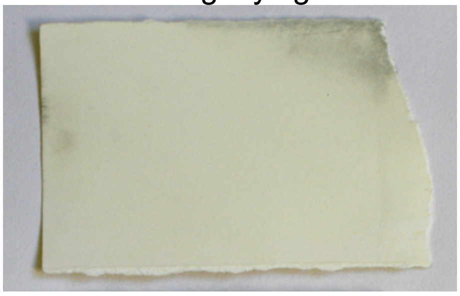
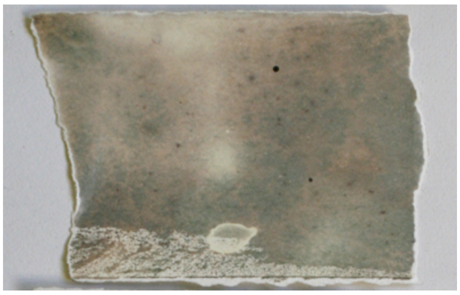
		acid, diluted 18x	
	Water	Poured on by mistake	
	Pre-exposure	? min	mid-brown
	Water	A few min	
	Dry	Overnight	Hanging
	Potassium iodide	Greene III formula	5 min
	Water	5 min	
	Exposure **20.5.11**	13:00 – 19:00 semi-cloudy	Fallen over
	Developer	Dokumol	
	Fixer		
	Water		
08. Fabriano Artistico	Silver nitrate	6%	Sprayed
Changing bag camera with 58 mm +4 magnifying lens + aperture	Potassium iodide	Greene III formula	Sprayed
	Water	20 min	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	
	Water	5-10 min	
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	5 min
	Water	5 min	
	Exposure **19.5.11**	12:50 – ? clear sky	Fallen over during exp.
	Developer	Dokumol	45 min
	Fixer		
	Water		
09. Fabriano Artistico	Silver nitrate	6%	Sprayed
5x4 camera, widest aperture	Potassium iodide	Greene III formula	Sprayed
	Water	20 min	Floated
	Dry	Overnight	
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.	< 5 min	

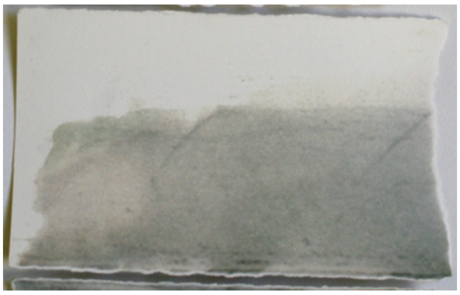
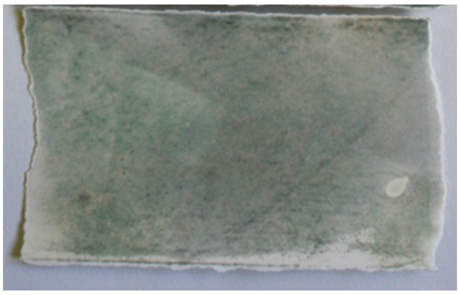
	Water	5-10 min	
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	5 min
	Exposure **22.5.11**	12:10 – 14:10	Vague image
	Developer	Dokumol	Image disappeared
	Fixer		
	Water		
10. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	2 min
	Water	0.5h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	4 min
	Pre-exp.	? min	
	Water		
	Dry		
	Pot. iodide	Greene III formula	
	Exposure **21.5.11**	10:20 – 11:20	No image
	Developer	Dokumol	
	Fixer		
	Water		
11. Southworth CV A5	Silver nitrate	6%	Glass rod
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	0.5h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	4 min
	Pre-exp.	? min	
	Water		
	Dry		
	Pot. iodide	Greene III formula	
	Exposure **21.5.11**	10:20 – 15:20	Fallen down; Vague image
	Developer	Dokumol	
	Fixer		
	Water		

12. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	2 min
	Water	0.5h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	4 min
	Pre-exp.	? min	
	Water		
	Dry		
	Pot.iodide	Greene III formula	
21.5.11	Exposure	12:30 – 14:40	White paper
	Developer	Dokumol, fresh	15 min, Image appeared
	Fixer		
	Water		

No washing after potassium iodide, before putting into camera.
Tape paper to the back of the camera so it doesn't fall down.
Use thicker paper to retain moisture?

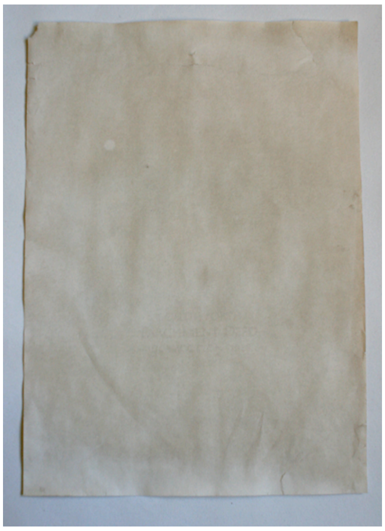
13. Southworth CV A6	Silver nitrate	6%	Glass rod
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	0.5h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x; old, replenished	4 min
	Pre-exp.	? min	
	Water	20 min	
	Dry		
	Pot. iodide	Greene III formula	5 min
22.5.11	Exposure	10:13 – 13:13 overcast; with blotter soaked in pot.iod.	White paper
	Developer	Dokumol	A few hours, image appeared
	Fixer		
	Water		
14. Fabriano Artistico (piece too small to judge success)	Silver nitrate	6%	Glass rod, repeatedly
Changing bag camera with	Potassium	Greene III formula	5 min; after 5 min

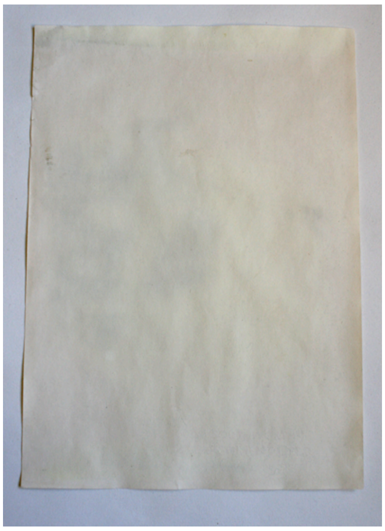
58 mm +4 magnifying lens 	iodide		from the above, paper not dry
	Water	1h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.		
	Water	10 min	
	Dry		
	Pot. iodide	Greene III formula	5 min
22.5.11	Exposure	14:05 – 16:25 overcast; with blotter	Not whitened, no image
	Developer	Dokumol	
	Fixer		
	Water		
15. Fabriano Artistico	Silver nitrate	6%	Glass rod, repeatedly
5x4 camera, widest aperture	Potassium iodide	Greene III formula	5 min; after 1h from the above
	Water	3h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.		
	Water	30 min	
	Dry		
	Pot. iodide	Greene III formula	5 min
23.5.11	Exposure	8:50 – 13:10 sunny	No image
	Developer	Dokumol	
	Fixer		
	Water		
16. Fabriano Artistico (piece too small to judge success)	Silver nitrate	6%	Glass rod, repeatedly
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	5 min
	Water	3h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th	5 min immersed

		of the volume acetic acid, diluted 18x	
	Pre-exp.		
	Water	30 min	
	Dry		
	Pot. iodide	Greene III formula	5 min
	Exposure **23.5.11**	8:50 – 13:10 sunny	No image
	Developer	Dokumol	
	Fixer		
	Water		
17. Fabriano Artistico (piece too small to judge success)	Silver nitrate	6%	Glass rod, repeatedly
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	5 min
	Water	3h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min immersed
	Pre-exp.		
	Water	30 min	
	Dry		
	Pot. iodide	Greene III formula	5 min
23.5.11	Exposure	13:15 – 16:15 sunny	No image
	Developer	Dokumol	
	Fixer		
	Water		
18. Fabriano Artistico A7	Silver nitrate	6%	Glass rod, repeatedly
5x4 camera, widest aperture	Pot. iodide	Greene III formula	15 min
	Water	1h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 – 10 min immersed
	Pre-exp.		
	Water	4 h	
	Dry		

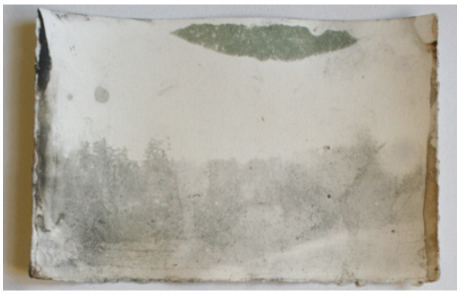
	Pot. iodide	Greene III formula	5 min
25.5.11	Exposure	12:08 – 13:08	Image visible PRINTED OUT
	Developer	Dokumol	Fainted in dev.?
	Fixer		
	Water		
19. Fabriano Artistico A7	Silver nitrate	6%	Glass rod, repeatedly
5x4 camera, widest aperture	Pot. iodide	Greene III formula	15 min
	Water	1h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 – 10 min immersed
	Pre-exp.		
	Water	4 h	
	Dry		
	Pot. iodide	Greene III formula	5 min
25.5.11	Exposure	13:15 – 15:15	Image visible PRINTED OUT
	Developer	Dokumol	Fainted in dev.?
	Fixer		
	Water		
20. Fabriano Artistico (piece too small to judge success)	Silver nitrate	6%	Glass rod, repeatedly
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	15 min
	Water	1h	
	Dry		
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 – 10 min immersed
	Pre-exp.		
	Water	4 h	
	Dry		
	Pot. iodide	Greene III formula	2 min
26.5.11	Exposure	11:30 – 12:50	Image visible PRINTED OUT
	Developer	Dokumol	
	Fixer		
	Water		

Careful with times of pot. iod. washes (keep short, i.e.<2 min)
Follow Talbot's according to Robert Hunt (1844): silver nitrate with a brush (glass rod); dip in pot.iod. 2-3 min, then dip in water, blot and hang to dry; wash over (with a cotton swab?) with aceto-nitrate, ½ min, dip in water, blot, pre-expose for a few seconds or until browning visible; dip in pot.iod. (without washing and drying?) – the discolouration should be removed, wash, blot and expose.

21. Southworth CV A4	Silver nitrate	6%	Glass rod
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	dip	blotted
	Dry		hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	0.5-1 min dip
	Pre-exp.	? min	patchy
	Water	5 min	
	Dry		hanging
	Pot. iodide	Greene III formula	
	Exposure **24.5.11**	10:25 – 11:55 sunny	Blotter; White paper with some patches
	Developer	Dokumol; gallic acid overnight; dokumol	
	Fixer		
	Water		

22. Southworth CV A4	Silver nitrate	6%	Glass rod
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	dip	blotted
	Dry		hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, not diluted	Cotton swab
	Pre-exp.	? min	Even darkening
	Water	5 min	warm
	Dry		hanging
	Pot. iodide	Greene III formula	2 min
	Exposure **24.5.11**	12:00 – 15:05 sunny	Blotter; White paper with some patches
	Developer	Dokumol; gallic acid overnight;	

		dokumol	
	Fixer		
	Water		
23. Fabriano Artistico A7 long	Silver nitrate	6%	Glass rod, semi-dried
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	Rinsed	Blotted
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, not diluted	Glass rod
	Pre-exp.		Turned violet
	Water	10 min, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
25.5.11	Exposure	17:40 – 19:30	No image as dark as after pre-exposure
	Developer	Dokumol	
	Fixer		
	Water		
24. Fabriano Artistico A7 long	Silver nitrate	6%	Glass rod, semi-dried
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	Rinsed	Blotted
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	3 min
	Pre-exposure		Turned yellow-brown
	Water	10 min, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula 20%	Cotton swab
	Water	Rinsed	
26.5.11	Exposure	14:55 – 16:10	
	Developer	Dokumol	
	Fixer		
	Water		

25. Fabriano Artistico A6 long	Silver nitrate	6%	Glass rod, semi-dried
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	Rinsed	Blotted
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, not diluted	Glass rod, rinsed after 1/2 min
	Pre-exp.		Slightly browned
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	Immediately, 2 min
26.5.11	Exposure	8:55 – 10:20	Overcast; no image
	Developer	Dokumol	
	Fixer		
	Water		
26. Fabriano Artistico A6 long	Silver nitrate	6%	Glass rod, semi-dried
Changing bag camera with 58 mm +4 magnifying lens	Potassium iodide	Greene III formula	2 min
	Water	Rinsed	Blotted
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, not diluted	Glass rod, rinsed after 1/2 min
	Pre-exp.		Slightly browned
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	Immediately, 2 min
	Water	Rinsed	
26.5.11	Exposure	10:25 – 11:25	Overcast
	Developer	Dokumol	
	Fixer		
	Water		

NRS. 27-35: VARYING TIMES IN POT.IOD. AND ACETO-NIT. WHILE KEEPING OTHER VARIABLES CONSTANT:

27. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	5 min

	Water	1h, warm	Face down
	Dry		hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	9:15 – 10:15 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
28. Southworth CV A7	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	5 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	9:15 – 10:15 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
29. Southworth CV A7	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	5 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1 min

	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Exposure **29.5.11**	10:20 – 11:35 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
30. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	2 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	10:20 – 11:35 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
31. Southworth CV A7	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	2 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	11:45 – 12:15 sunny	

	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
32. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	2 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	11:45 – 12:15 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
33. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	10 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	12:20 – 13:00 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
34. Southworth CV A7	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	10 min

	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	5 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	12:20 – 13:00 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		
35. Southworth CV A7	Silver nitrate	6%	Glass rod
5x4 camera, widest aperture	Pot. iodide	Greene III formula	10 min
	Water	1h, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1 min
	Pre-exp.	2 min	
	Water	1h, warm	
	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
29.5.11	Exposure	13:05 – 13:35 sunny	
	Developer	Dokumol; first cold, then warm	Image appears in warm dev.
	Fixer		
	Water		

Variations in times of baths don't appear to make a visible difference, however, baths work best in comparison with other methods of application (spray, cotton swab). Development only takes place in warm developer (i.e. prepared with freshly boiled water) – this might have been a reason for some of the previous tests in this method not being successful (latent image formed but not developed)!

36. Khadi Rag 150gsm A4	Silver nitrate	20%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	2.5 min
	Water	1h, warm	
	Dry		Hanging

	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	3 min, sunlight	
	Water	1h	
	Dry		Hanging
	Pot. iodide	Greene III formula	1.5 min
	Exposure **30.5.11**	12:20 – 12:50 sunny; by Das Boot bar looking East over the river	In a plastic transparent bag
	Developer	Dokumol, hot	
	Fixer	hot	Still yellow
	Water		

Tray ribs or plastic bag folds created vertical strips on the image – move paper around in baths for even distribution.

37. Khadi Rag 150gsm A4	Silver nitrate	10%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	2 min
	Water	1h, warm	
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	3 min, sunlight	
	Water	1h	
	Dry		Hanging
	Pot. iodide	Greene III formula	Sprayed onto paper in camera
	Exposure **31.5.11**	11:00 – 12:00 lightly overcast; by the path to Lischana hut, at 1900m, second river crossing, overlooking a waterfall	
	Developer	3h Dokumol, hot	
	Fixer		
	Water		

Below: holding in front of a radiator during development to provide the heat needed by the process (Talbot instructs to hold paper by an open fire or by hot steam).

38. Khadi Lokta brown A4	Silver nitrate	20%	Sprayed (soaks

			quickly)
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	1 min
	Water	1h, warm	
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	15 min, overcast	
	Water	1h	
	Dry		Hanging
	Pot. iodide	Greene III formula	brushed
	Exposure **2.6.11**	9:30 – 14:00 overcast some sun	
	Developer	old Dokumol, alternating with	holding in front of a hot radiator
	Fixer		
	Water		
39. Hahnemuhle bamboo	Silver nitrate	20%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	2 min
	Water	1h, warm	
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	3 min, sunlight	
	Water	1h	
	Dry		Hanging
	Pot. iodide	Greene III formula	brushed
	Exposure **1.6.11**	17:30 – 20:00 overcast	Faint image
	Developer	old Dokumol, alterating with	holding in front of a hot radiator
	Fixer	overnight	Image disappeared
	Water		
40. Hahnemuhle bamboo	Silver nitrate	20%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Potassium iodide	Greene III formula	2 min

	Water	1h, warm	
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	3 min, sunlight	
	Water	1h	
	Dry		Hanging
	Pot. iodide	Greene III formula	brushed
	Exposure **2.6.11**	15:30 – 19:00 overcast	No image, just stains
	Developer	old Dokumol, warm	
	Fixer		
	Water		

DON'T APPLY POT.IOD. WITH A BRUSH – NOT ENOUGH.
DON'T LEAVE IN THE FIX OVERNIGHT – BLEACHES OUT.

41. Fabriano Artistico A4	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	3 min, overcast	Turned yellow-brown, light tone
	Water	1h, warm	
	Dry	2h (not dried completely)	Hanging
	Pot. iodide	Greene III formula	2 min
	Exposure **23.6.11**	12:10 – 15:30 overcast	On blotter sprayed with water, covered with foil
	Developer	Moersch Eco 4812 hot, fresh	Image appeared
	Fixer	Hot, fresh x2	
	Water		
42. Fabriano Artistico A4	Silver nitrate	6%	Glass rod
Changing bag camera with	Dry		Hanging

65 mm magnifying glass lens			
	Pot. iodide	Greene III formula	2 min
	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	2 min, overcast, evening around 18:00	Turned yellow-brown, light tone
	Water	1-2h, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	In a black plastic bag, inserted in the sun
24.6.11	Exposure	15:20 – 16:10 sunny; under Piz Linguard overlooking Piz Albris	
	Developer	Moersch Eco 4812 hot, fresh x2	Image appeared
	Fixer	Hot, fresh, overnight	Image disappeared
	Water		

The paper is sensitive enough for even a few seconds long exposure to daylight when inserting it into the camera bleaches it – image does not have dark tones. Below a method of pouring some pot.iod. into a plastic bag (nr. 43; or alternatively spraying it: nr. 45), in which the paper is also kept moist throughout the exposure was tested (all done inside the camera to avoid the above mistake).
Don’t leave in the fix overnight!

43. Hahnemuhle bamboo	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	2 min, overcast	Turned grey-brown, mid tone
	Water	1h, warm	
	Dry		Hanging

	Potassium iodide	Greene III formula	50ml poured into a plastic bag with blotting paper, inside the camera
	Exposure **26.6.11**	10:00 – 12:00 sunny	Highlights burned out (too long?)
	Developer	Moersch Eco 4812 hot, fresh	
	Fixer	Hot, fresh, 5 min	
	Water		
2h exposure is too long, try shorter ones following the same procedure.			
44. Hahnemuhle bamboo	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Dry		Almost flat
	Pot. iodide	Greene III formula	2 min
	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	2 min, overcast	Turned grey-brown, mid tone
	Water	1h, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula, immersed 1min	put into a plastic bag with saturated blotting paper
	Exposure **26.6.11**	12:25 – 12:40	sunny
	Developer	Moersch Eco 4812 hot, fresh, 1 min	Image appeared immediately
	Fixer	warm, old, 10 min	
	Water		
45. Hahnemuhle bamboo	Silver nitrate	6%	Glass rod
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min

	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	10 min, sunny, noon	Turned dark grey-brown
	Water	1h, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	Sprayed onto paper in a plastic bag (no blotter), distributed through the foil
	Exposure **26.6.11**	17:40 – 18:40 sunny	Printed out (pre-exp. too long)
	Developer	Moersch Eco 4812 warm, old	Started darkening
	Fixer	Hot, fresh	
	Water		
46. Southworth CV A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	3 min, sunny, in shade, around 18:00	
	Water	1h, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	Sprayed onto paper in a plastic bag (no blotter), distributed through the foil
	Exposure **27.6.11**	9:10 – 9:55 sunny	Printed out slightly
	Developer	Moersch Eco 4812 first old,	

		cold, then hot, fresh	
	Fixer	first old, cold, then hot, fresh	
	Water		
TO CHECK WHETHER LEAVING PAPER FOR SOME TIME BETWEEN POT.IOD. APPLICATION AND EXPOSURE MAKES A DIFFERENCE:			
47. Canson Fontenay NOT A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Water	30 min, warm	Face down
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	2.5 min, sunny, in shade, around 19:00	
	Water	1h, warm	Accidentally some old dev. Has fallen into the bath; water changed
	Dry		Hanging
	Potassium iodide	Greene III formula	50ml poured into a plastic bag (no blotter), inside the camera, left flat in the camera for 2h
27.6.11	Exposure	12:55 – 13:35 sunny	White paper
	Developer	Moersch Eco 4812 hot, fresh	No image
	Fixer	Hot, fresh	
	Water		
48. Gampi A4 on acetate	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Water	1-2h, warm	Face up, shallow tray

	Dry	A few hours	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1.5 min
	Pre-exposure	1.5 min, sunny, in shade, around 18:00	
	Water	1.5h, warm	Face up, shallow tray
	Dry	Overnight	Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **28.6.11**	10:15 – 10:45 sunny with clouds	
	Developer	Moersch Eco 4812 old, warm, then fresh, hot	Paper blackened but no image
	Water	Hot, 20min	
	Fixer	Hot, fresh, a few min	
	Water	Warm, 1h	
49. Fabriano 5 A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Water	1-2h, warm	Face up
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	1.5 min, sunny, in shade, around 18:00	
	Water	1.5h, warm	Face up, shallow tray
	Dry	Overnight	Hanging
	Pot. iodide	Greene III formula	2 min
	Exposure **28.6.11**	11:55 – 12:30 sunny with clouds	
	Developer	Moersch Eco 4812 hot, fresh, 4h	No image, no darkening
	Fixer	Cold	

	Water		
Aceto-nitrate exhausted in the above?			
50. Fabriano 5 A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Water	2.5h, warm	Face down
	Dry	Overnight	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	1.5 min, sunny, in shade, around 10:00	
	Water	1h, warm	Face up, shallow tray
	Dry		Hanging
Once again in case previous aceto-nitrate was exhausted (which might have been the cause of no image in nr 49).	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1.5 min
	Pre-exposure	2 min, sunny, in shade, around 16:00	
	Water	1h, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	poured into plastic bag
29.6.11	Exposure	11:25 – 11:35	Printed out
	Developer	Moersch Eco 4812 old, then hot, fresh	
	Fixer	Fresh, hot	
	Water	1, warm	
51. Fabriano 5 A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Water	2.5h, warm	Face down
	Dry	Overnight	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted	2 min

		18x	
	Pre-exposure	1.5 min, sunny, in shade, around 18:00	
	Water	1.5h, warm	Face up, shallow tray
	Dry	Overnight	Hanging
Once again in case previous aceto-nitrate was exhausted (which might have been the cause of no image in nr 49):	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1.5 min
	Pre-exposure	2 min, sunny, in shade, around 16:00	
	Water	1h, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	50ml poured into plastic bag with camera open
3.7.11	Exposure	13:58 – 14:08 overcast, on Fuorcla Champatsch overlooking Piz Davo Lais	
	Developer	Moersch Eco 4812 hot, fresh	Very faint image (horizon outline)
	Fixer	Fresh, hot	
	Water		
Too much light got in while pouring pot.iod. into plastic bag in-camera.			
52. Fabriano 5 A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Water		
	Dry	Overnight	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted	2 min

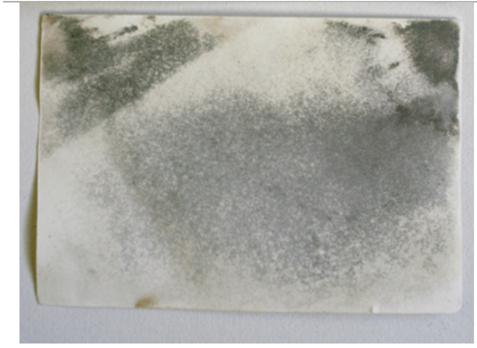
		18x	
	Pre-exposure	1.5 min, sunny	in shade, around 13:00
	Water	1h, warm	Face up
	Dry		Hanging
	Potassium iodide	Greene III formula	Poured into plastic bag (in the darkroom?)
	Exposure **29.6.11**	10:25 – 11:15 sunny	White paper
	Developer	Moersch Eco 4812 warm, old, then fresh	No image, no darkening
	Fixer	Fresh, hot	
	Water		
Nrs 49 and 52 – exposure too long (image bleached out)?			
53. Mitsumata 60gsm A4	Silver nitrate	6%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
[no image – paper disintegrated]	Pot. iodide	Greene III formula	2 min
	Water	1-2h, warm	Face up, shallow tray
	Dry		Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	1.5-2 min
	Pre-exposure	1.5 min, sunny, in shade, around 18:00	
	Water	1.5h, warm	Face up
	Dry	Overnight	Hanging
	Potassium iodide	Greene III formula	>2 min – difficulties taking out and lying flat for exposure
28.6.11	Exposure	11:00 – 11:45 sunny with clouds	White paper
	Developer	Moersch Eco 4812 old, warm then hot, fresh 4h	No image, no darkening
	Fixer	Cold	
	Water	Paper disintegrated completely (poor wet strength)	

54. Fabriano 5 A4	Silver nitrate	15%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Water	1h, cold	Face down, shallow tray
	Dry	Overnight	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	1 min	
	Water	1.5h	
	Dry		Hanging
	Potassium iodide	Greene III formula	50ml poured into plastic bag inside the camera (no light getting in)
	Exposure **4.7.11**	15:19 – 15:30 sunny	
	Developer	Moersch Eco 4812 hot, fresh	Image formed in 1-2 min
	Fixer	Hot, fresh	
	Water	A few hours	
55. Khadi Rag 150gsm A4 RE-USED from previous failed exposures	Silver nitrate	15%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Water	1h, warm	
	Dry	Overnight	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exposure	1 min	
	Water	1.5h	
	Dry		Hanging
	Potassium iodide	Greene III formula	50ml poured into plastic bag inside the camera
5.7.11	Exposure	15:36 – 15:44	

		overcast, on Fuorcla Maisas overlooking Stammerspitz	
THE NEXT DAY	Developer	Moersch Eco 4812 hot, fresh	Darkening, but no image
	Fixer	Hot, fresh 30 min	
	Water	1-2h	
Re-using paper OR leaving dev. and fix till next day fails to produce an image. The next one (nr 56) done to check which of those was the reason.			
56. Khadi Rag 150gsm A4 RE-USED from previous failed exposures	Silver nitrate	15%	Cotton swab
Changing bag camera with 65 mm magnifying glass lens	Dry		Hanging
	Pot. iodide	Greene III formula	2 min
	Water	1h, warm	
	Dry	Overnight	Hanging
	Aceto-nitrate	10%sil.nit. +1/5th of the volume acetic acid, diluted 18x	2 min
	Pre-exp.	1 min	
	Water	1.5h	
	Dry		Hanging
	Potassium iodide	Greene III formula	50ml poured into plastic bag in darkroom
	Exposure **6.7.11**	19:09 – 19:20 sun with clouds	Didn't whiten
	Developer	Moersch Eco 4812 hot, fresh	Darkening, but no image
	Fixer	Hot, fresh 30 min	
	Water	1-2h	

Re-using papers causes problems.

Bayard's printing-out process (Passafiume 2001, Osterman 2005b, Ware 1994):

001. Southworth CV A7	Sodium Chloride	2%	1 min floated
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.		Patches
	Water	10 min	Warm
	Dry		
	Potassium iodide	Greene III formula	4 min
	Exposure **21.5.11**	15:50 – 18:00	White paper
	Developer	Dokumol	Overnight, image appeared
	Fixer		
	Water		
002. Southworth CV A7	Sodium Chloride	2%	1 min floated
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.		Patches
	Water	Warm 10 min	
	Dry		
	Potassium iodide	Greene III formula	4 min
	Exposure **23.5.11**	13:15 – 16:15 sunny	White paper
	Developer	Dokumol	
	Fixer		
	Water		
003. Southworth CV A4	Sodium Chloride	2%	Brushed, hung
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod, thickly
	Dry		Hanging
	Pre-exposure		Patches, dark violet; corner which was down when hanging darker
	Water	Warm 10 min	With salt added
	Dry		hanging
	Potassium iodide	Greene III formula	4 min
	Exposure **24.5.11**	8:15 – 10:15 sunny	Blotter; fallen down; White paper
	Developer	Dokumol	
	Fixer		
	Water		

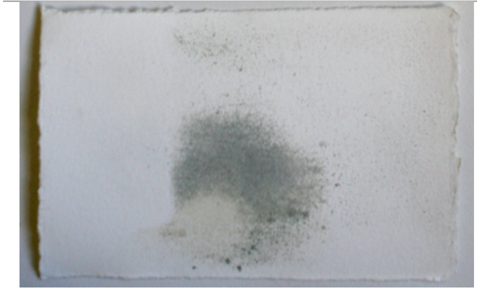
Soak or immerse in salt solution for longer or brush repeatedly and dry flat. (LATER

FOUND OUT TO BE WRONG - Osterman 2005b

004. Southworth CV 20x20cm	Sodium Chloride	2%	Brushed, dried flat
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.		Only dots darker
	Water	Warm 10 min	With salt added
	Dry		hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **27.5.11**	8:20 – 9:20 sunny	White paper
	Developer	Dokumol; gallic acid overnight; dokumol	
	Fixer		
	Water		
005. Southworth CV A4	Sodium Chloride	2%	Soaked 10 min, warm
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Cotton swab (too rough on the thin paper? Surface scraped)
	Dry		Hanging
	Pre-exp.		Patches
	Water	Warm 10 min	
	Dry		hanging
	Potassium iodide	Greene III formula	
	Exposure **24.5.11**	15:10 – 19:30 sunny	White paper
	Developer	Dokumol; gallic acid overnight; dokumol	
	Fixer		
	Water		
006. Canson Fontenay NOT side A6	Sodium Chloride	2%	Floated 5 min
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Cotton swab
	Dry		Hanging
	Pre-exp.		
	Water	Warm 10 min	
	Dry		hanging
	Potassium iodide	Greene III formula	2 min
	Exposure	11:20 –	Patchy paper, no

	25.5.11	11:50 sunny	image
	Developer	Dokumol	After some hours image appeared
	Fixer		
	Water		

Floating on salt solution works best, but for longer (WRONG - Osterman 2005b); silver nitrate thicker (with glass rod or cotton swab, without spraying)

007. Canson Fontenay NOT side A6	Sodium Chloride	2%	Brushed
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Cotton swab
	Dry		Hanging
	Pre-exp.		
	Water	Warm 10 min	
	Dry		hanging
	Potassium iodide	Greene III formula	2 min
	Water		Rinsed
	Exposure **25.5.11**	12:00 – 13:00 sunny	Paper fell down during exposure, no image
	Developer	Dokumol	
	Fixer		
	Water		
008. Canson Fontenay NOT side A6	Sodium Chloride	2%	Brushed twice, dried in-between
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Cotton swab
	Dry		Hanging
	Pre-exp.		
	Water	Warm 10 min	
	Dry		hanging
	Potassium iodide	Greene III formula	2 min
	Water		Rinsed
	Exposure **25.5.11**	13:10 – 15:10 sunny	White paper, no image
	Developer	Dokumol	
	Fixer		
	Water		
009. Canson Fontenay NOT side A7	Sodium Chloride	2%	Floated 20 min
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		Hanging
	Pre-exposure		½ of the surface darkened well
	Water	Warm	
	Dry		hanging

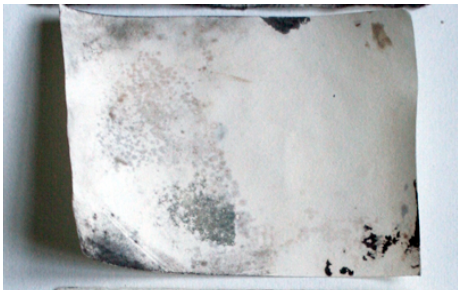
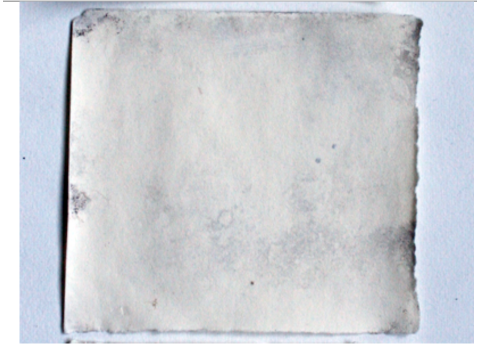
	Potassium iodide	Greene III formula	2 min
	Water		Rinsed
	Exposure **25.5.11**	15:20 – 17:30 sunny	No image
	Developer	Dokumol	
	Fixer		
	Water		
010. Canson Fontenay NOT side A7	Sodium Chloride	2%	Floated 3 h 20 min
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		Hanging
	Pre-exp.		½ darkened well
	Water	Warm	
	Dry		hanging
	Potassium iodide	Greene III formula	2 min
	Water		Rinsed
	Exposure **25.5.11**	17:40 – 19:30 sunny	Faint image?
	Developer	Dokumol	
	Fixer		
	Water		

According to Mike Ware’s (1994) instructions on Talbot’s process (especially the alternating silver nitrate and potassium bromide applications to increase sensitivity):

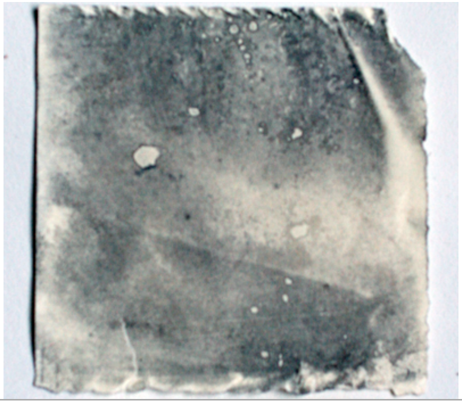
011. Canson Fontenay NOT side A7	Sodium Chloride	2%	Immersed 15 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Potassium bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		Flat (after each of the above)
	Pre-exposure		Patchy, didn’t brown much except one area
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	1 min, immediately
26.5.11	Exposure	11:00–11:30	sunny
	Developer	Dokumol	
	Fixer		
	Water		
012. Canson Fontenay NOT side A7	Sodium Chloride	2%	Immersed 15 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Potassium bromide	10%	Cotton swab

	Silver nitrate	6%	Glass rod
	Potassium bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		Flat (after each of the above)
	Pre-exp.	Moist	5 min, turned blueish
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	20% cotton swab
26.5.11	Exposure	12:00 – 12:50 sunny	
	Developer	Dokumol	After some time changed for a fresh and warm one, ½ h later images appeared
	Fixer		
	Water		
013. Canson Fontenay NOT side A7	Sodium Chloride	2%	Immersed 15 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Potassium bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Potassium bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		Flat (after each of the above)
	Pre-exp.		
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	20% cotton swab
	Water	Rinsed 0.5 min	Blotted
26.5.11	Exposure	13:00 – 14:45	sunny with some clouds
	Developer	Dokumol	After some time changed for a fresh and warm one, ½ h later images appeared
	Fixer		
	Water		
014. Canson Fontenay NOT side A7	Sodium Chloride	2%	Immersed 15 min in a stack, rotating the order; blotted
Changing bag camera with	Silver nitrate	6%	Glass rod

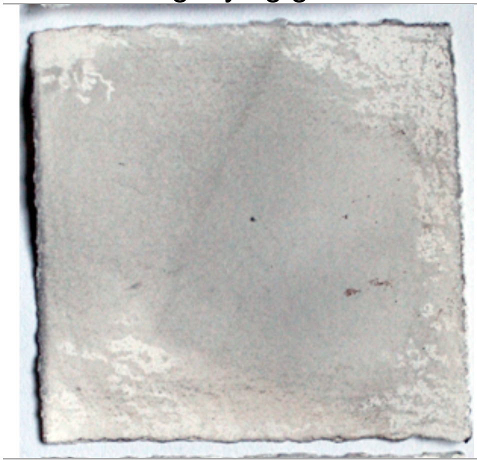
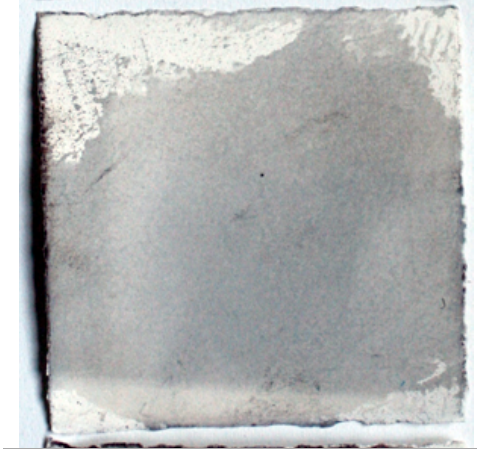
65 mm magnifying glass lens			
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		Flat (after each of the above)
	Pre-exp.		
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	20% cotton swab
	Water	Rinsed 0.5 min	
	Exposure **26.5.11**	13:00 – 14:45	sunny with some clouds
	Developer	Dokumol	After some time changed for a fresh and warm one, ½ h later images appeared
	Fixer		
	Water		
015. Southworth CV 10x10 cm	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exposure		10 min, didn't darken much, just some spots
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	20% cotton swab, left for 1 min
	Water	Rinsed	Blotted
26.5.11	Exposure	16:25–17:30	sunny with some clouds
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
016. Southworth CV A7	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod

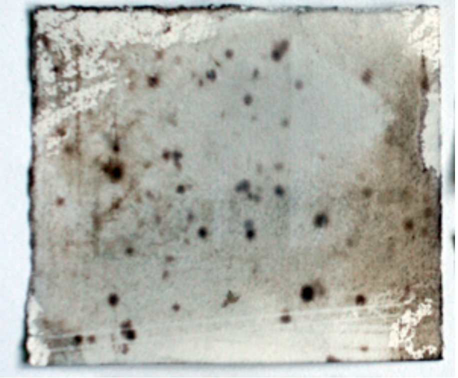
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Potassium bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exposure		10 min, didn't darken much, just some spots
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	20% cotton swab, left for 1 min
	Water	Rinsed	Blotted
26.5.11	Exposure	16:25 – 17:30	sunny with some clouds
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
017. Southworth CV 10x10 cm	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exposure		5 min, turned pale blue, except stronger cotton swab outlines
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	20% cotton swab
27.5.11	Exposure	8:20 – 8:50 overcast, rain	White paper
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
018. Southworth CV 10x10 cm	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab

	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exposure		5 min, turned pale blue, except stronger cotton swab outlines
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	2 min
27.5.11	Exposure	9:00 – 10:00	overcast, rain
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
019. Southworth CV 10x10 cm	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exp.		
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	2 min
27.5.11	Exposure	10:15-12:15	overcast, rain
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
020. Southworth CV 10x10 cm	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exp.		
	Water	10 min	warm

	Dry		
	Potassium iodide	Greene III formula	5 min
	Exposure **27.5.11**	13:30–15:00	overcast, rain
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
021. Southworth CV 10x10 cm	Sodium Chloride	2%	Immersed 10 min in a stack, rotating the order; blotted
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Po. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Cotton swab
	Dry		Flat (after each of the above)
	Pre-exp.		
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	10 min
27.5.11	Exposure	16:15–21:40	overcast, rain
	Developer	Dokumol	After some time changed for a fresh and warm one
	Fixer		
	Water		
022. Fabriano Artistico 10x10 cm	Sodium Chloride	2%	Floated, 10 min
5x4 camera, widest aperture	Silver nitrate	6%	Cotton swab
	Dry		
	Pre-exposure	5 min	Uneven coating, strokes of cotton swab visible
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	20%, cotton swab, kept ½ - 1 min
	Water	Rinsed, ½ min	Blotted
	Exposure **26.5.11**	14:55–16:15	overcast
	Developer	Dokumol	
	Fixer		
	Water		
023. Fabriano Artistico 10x10 cm	Sodium Chloride	2%	Floated, 20 min

Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Cotton swab
	Dry		
	Silver nitrate	6%	Cotton swab
	Dry		
	Pre-exp.	5 min	
	Water	10 min	warm
	Dry		
	Potassium iodide	Greene III formula	20%, cotton swab, kept ½ - 1 min, dipped into 4% solution to moisten the paper to stick in the camera
26.5.11	Exposure	17:40–21:30	overcast
	Developer	Dokumol	
	Fixer		
	Water		
024. Fabriano Artistico 10x10 cm	Sodium Chloride	2%	Floated, 1 h
5x4 camera, widest aperture	Silver nitrate	6%	Cotton swab
	Dry		
	Silver nitrate	6%	Cotton swab
	Dry		
	Pre-exp.	5 min	
	Water	10min, warm	
	Dry		
	Potassium iodide	Greene III formula	20%, cotton swab, kept ½ - 1 min, sheet quite dry
	Exposure **26.5.11**	17:40–21:30	overcast
	Developer	Dokumol	
	Fixer		
	Water		
NRS. 025-033: VARYING TIMES IN POT.IOD. AND WATER AFTERWARDS WHILE KEEPING OTHER VARIABLES CONSTANT:			
025. Fabriano Artistico 10x10 cm	Sodium Chloride	2%	>15 min, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	1 min
	Exposure **28.5.11**	9:00 – 10:30 overcast	
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		

026. Fabriano Artistico 10x10 cm	Sodium Chloride	2%	>15 min, blotted with kitchen towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	2 min
	Exposure **28.5.11**	10:40 – 11:45	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
027. Fabriano Artistico 10x10 cm	Sodium Chloride	2%	>15 min, blotted with kitchen towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	-	
	Dry	-	
	Potassium iodide	Greene III formula	5 min
	Exposure **28.5.11**	12:05 – 14:00	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
028. Fabriano Artistico A7	Sodium Chloride	2%	>15 min, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	1 min
	Exposure **28.5.11**	10:40 – 11:45	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
029. Fabriano Artistico A7	Sodium Chloride	2%	>15 min, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		

	Pre-exp.	1 h	Did not darken
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	2 min
	Exposure **28.5.11**	12:05 – 14:00	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
030. Fabriano Artistico A7	Sodium Chloride	2%	>15 min, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	10 min, warm	
	Dry		
	Potassium iodide	Greene III formula	5 min
	Exposure **28.5.11**	14:10 – 16:20	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
031. Fabriano Artistico A7	Sodium Chloride	2%	>15 min, blotted with kitchen towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	10 min, warm, with salt	
	Dry		
	Potassium iodide	Greene III formula	1 min
	Exposure **28.5.11**	14:10 – 16:20 overcast	
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
032. Fabriano Artistico A7	Sodium Chloride	2%	>15 min, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	10 min,	

		warm, with salt	
	Dry		
	Potassium iodide	Greene III formula	2 min
	Exposure **28.5.11**	16:30 – 19:50	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
033. Fabriano Artistico A7	Sodium Chloride	2%	>15 min, blotted with kitchen towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Dry		
	Pre-exp.	1 h	Did not darken
	Water	10 min, warm, with salt	
	Dry		
	Potassium iodide	Greene III formula	5 min
	Exposure **28.5.11**	16:30 – 19:50	overcast
	Developer	Dokumol	Changed repeatedly for fresh and warm
	Fixer		
	Water		
034. Conda bamboo 105gsm A6	Sodium Chloride	2%	3h 30min in a stack, blotted with kitchen towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	20%	Glass rod
	.mide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Dry		Flat, after each of the above
	Pre-exp.	6 min	In shade, sunny, noon
	Water	10 min, warm	Face down, not overlapping
	Dry		
	Potassium iodide	Greene III formula	1 min
29.5.11	Exposure	17:30 – 18:00 sunny	Just one brown area
	Water		
	Fixer		
	Water		
035. Conda bamboo 105gsm A6	Sodium Chloride	2%	3h 30min in a stack, blotted with kitchen

			towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Dry		Flat, after each of the above
	Pre-exp.	6 min	In shade, sunny, noon
	Water	10 min, warm	Face down, not overlapping
	Dry		
	Potassium iodide	Greene III formula	2 min (turned lighter than nr 034)
29.5.11	Exposure	14:00 – 15:00 sunny	No image, just stains
	Water	Hot	
	Developer	Dokumol, hot	Turned dark overall
	Fixer		
	Water		
036. Conda bamboo 105gsm A6	Sodium Chloride	2%	3h 30min in a stack, blotted with kitchen towel
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Dry		Flat, after each of the above
	Pre-exp.	6 min	In shade, sunny, noon
	Water	10 min, warm	Face down, not overlapping
	Dry		
	Potassium iodide	Greene III formula	2 min (turned lighter than nr 034 and 035?)
	Exposure **29.5.11**	15:10 – 17:20 sunny	White paper
	Water	Hot	
	Developer	Dokumol, cold	No change
	Fixer		
	Water		
037. Conda bamboo 105gsm A6	Sodium Chloride	2%	3h 30min in a stack, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod

	Dry		Flat, after each of the above
	Pre-exp.	6 min	In shade, sunny, noon
	Water	10 min, warm	Face down, not overlapping
	Dry		
	Potassium iodide	Greene III formula	2 min (turned lighter than nr 034)
30.5.11	Exposure	9:30 – 10:30 sunny	No image, just brown
	Water		
	Developer	Dokumol, hot??	Darkening appeared??
	Fixer		
	Water		
038. Conda bamboo 105gsm A6	Sodium Chloride	2%	3h 30min in a stack, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Dry		Flat, after each of the above
	Pre-exp.	6 min	In shade, sunny, noon
	Water	10 min, warm	Face down, not overlapping
	Dry		
	Potassium iodide	Greene III formula	2 min (turned lighter than nr 034), and some 20% poured over paper in darkslide
30.5.11	Exposure	10:40–13:05	White paper
	Water		
	Developer	Dokumol, hot	Faint image appeared
	Fixer		
	Water		
039. Conda bamboo 105gsm A6	Sodium Chloride	2%	3h 30min in a stack, blotted with kitchen towel
5x4 camera, widest aperture	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	20%	Glass rod
	Dry		Flat, after each of the above
	Pre-exp.	6 min	In shade, sunny, noon
	Water	10 min, warm	Face down, not overlapping

	Dry		
	Potassium iodide	Greene III formula	2 min (turned lighter than nr 034), and some 20% poured over paper in darkslide
30.5.11	Exposure	13:55–17:30	White paper with stains
	Water		
	Developer	Dokumol, hot, old	Faint image appeared
	Fixer		
	Water		

Silver nitrate solution increased to 20% - no visible change.

Below – drying by radiator tested (Talbot instructs to dry by an open fire).

040. Conda bamboo 105gsm A3	Sodium Chloride	2%	Brushed, left for a few minutes, blotted and dried, repeated 3x
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod, dried by radiator
	Potassium bromide	10%	Cotton swab, dried by radiator
	Silver nitrate	6%	Glass rod, dried flat
	Potassium bromide	10%	Cotton swab, dried flat
	Dry		
	Pre-exposure		In direct sunlight, noon, turned green-blueish with some dark spots
	Water	10 min, warm	Face down, not overlapping
	Dry		
	Potassium iodide	Greene III formula	brushed
	Exposure **3.6.11**	10:30 – 14:20 overcast	Didn't whiten
	Water		
	Developer	Dokumol, old, warm	
	Fixer		
	Water		

CONCLUSION: NOT ENOUGH DARKENING DURING PRE-EXPOSURE CAUSED BY NOT ENOUGH SALT COATING (WRONG - in fact the opposite is true – an excess of silver has to be formed, so less salt and more silver nitrate is necessary for proper darkening needed in this process; light darkening is characteristic of papers that later require development - silver chloride developing out papers (Osterman 2005b))

041. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab

	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		Flat after each of the above
	Pre-exp.	overcast	Turned dark purple
	Water	10 min	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **4.6.11**	15:30 – 19:40 sun, some rain	Fallen over inside the camera at some point, paper not whitened
	Developer	Moersch Eco 4812 hot	
	Fixer		
	Water		
042. Khadi Rag 150gsm A4	Sodium Chloride	2%	Brushed
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		Flat after each of the above
	Pre-exposure	Overcast	Turned dark purple
	Water	10 min	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **5.6.11**	9:15 – 14:00 sun, some rain	Image printed out, but only the part of the paper which kept moist throughout the exposure (bottom edge)
	Developer	Moersch Eco 4812 hot	Started to darken, moved into fix quickly
	Fixer	Hot	
	Water		
043. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
(no image, paper re-used)	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		After each of the

			above
	Pre-exposure	8 min	One spot dark, rest light
	Water	10 min	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
7.6.11	Exposure	11:00 – 16:30 some sun, mostly overcast	Almost white paper (the lightly pre-exposed areas bleached out, while the darker ones didn't get enough exposure?)
	Developer	Moersch Eco 4812 old, warm, overnight	
	Fixer		
	Water		
044. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		After each of the above
	Pre-exp.	20 min	Spots dark, rest light
	Water	10 min	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **8.6.11**	9:00 – 10:20 overcast	No image
	Developer	Moersch Eco 4812 first old, then fresh and hot	Image quickly appeared
	Fixer		
	Water		
045. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)
Bottomless camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
(no image, paper re-used)	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot.bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod

	Dry		After each of the above
	Pre-exp.		
	Water		
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
11.6.11	Exposure	9:45 – 13:00 overcast, some sun; on sand under the road by NAIRS	Image printed out, but nothing interesting in the frame (pointed to the sky at an angle)
	Fixer	Silverfix, old	Image disappeared
	Water		
046. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)
Bottomless camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		After each of the above
	Pre-exp.		
	Water		
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **11.6.11**	9:45 – 13:00 overcast, some sun; on the stone river bank	Image printed out
	Fixer	Silverfix, old	Image disappeared
	Water		
Below: exposure with blotter, later also covered with foil, to keep paper moist.			
047. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		After each of the above

	Pre-exp.	Afternoon	Mid-tone of darkening
	Water	15 min	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **14.6.11**	10:00–12:00 sun, some rain	With blotter; faint image of the horizon visible
	Developer	Moersch Eco 4812 warm, fresh, then hot, fresh	Image appeared immediately in the strong hot dev.
	Fixer		
	Water		
048. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		After each of the above
	Pre-exp.	Afternoon	Mid-tone of darkening
	Water	15 min	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **14.6.11**	12:15–12:45 again 13:00 – 19:00 sun, some rain	With blotter; white paper
	Developer	Moersch Eco 4812 hot, fresh	Image appeared immediately in the strong hot dev.
	Fixer		
	Water		
049. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab

	Silver nitrate	6%	Glass rod
	Pot. bromide	10%	Cotton swab
	Silver nitrate	6%	Glass rod
	Dry		After each of the above
	Pre-exp.	Evening 2-3h	
	Water	Warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **15.6.11**	12:20 – 14:50 by Tamagur Dadora, overlooking Piz Murtera	With blotter; white paper
	Developer	Moersch Eco 4812 hot, fresh 5-10 min	
	Fixer	Cold, fresh	
	Water		
050. Hahnemuhle bamboo	Sodium Chloride	2%	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	10%	Glass rod
	Dry	30 min	Flat
	Pre-exp.		Darkened a lot quickly
	Water	10 min, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **17.6.11**	9:30 – 14:30 overcast	With blotter sprayed with water; image visible, just some spots dried too fast
	Fixer		
	Water		
051. Hahnemuhle bamboo	Sodium Chloride	2%	Brushed, blotted and dried repeatedly (first time with gelatine, then salt only)

Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	10%	Glass rod
	Dry	30 min	Flat
	Pre-exposure		Darkened a lot quickly
	Water	10 min, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **17.6.11**	14:30 – 20:30 overcast	With blotter sprayed with water; image visible, just some spots dried too fast
	Fixer	Hot	
	Water		

052. Khadi Rag 150gsm A4	Sodium Chloride	2%, with gelatine	Brushed, blotted and dried (only once)
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	10%	Glass rod
	Dry	30 min	Flat
	Pre-exposure	10 min	Darkened to mid-brown
	Water	10 min, warm	
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **18.6.11**	11:00 - ??	With blotter sprayed with water, covered with foil
	Fixer		Light toned after exp. and fix.
	Water	3 days	Turned grey overall

053. Khadi Rag 150gsm A4	Sodium Chloride	2%	Brushed, blotted and dried repeatedly
Changing bag camera with	Silver nitrate	10%	Glass rod

65 mm magnifying glass lens			
	Dry	½ - 1 h	
	Pre-exposure	Evening, rain	Darkened to light violet, one patch dark
	Water		
	Dry		Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **22.6.11**	11:10 – 12:40 overcast, some sun	With blotter sprayed with water, covered with foil
	Developer	Moersch Eco 4812 fresh, hot	Image in lighter parts appeared, dark patch remained
	Fixer	Fresh, hot, 20 min	
	Water		

Nrs. 054. and 055.: Attempts at achieving the coating that darkens deeply on pre-exposure (this is a silver chloride printing out process, which Bayard and others used)

054. Canson Fontenay NOT side A4	Sodium Chloride	2%	Brushed, blotted and dried quickly not allowing it to sink in much
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	10%	Glass rod
	Dry		Darkened a lot already
	Pre-exposure	5 min, overcast, around 14:00	Turned deep brown quickly
	Water	10 min, warm	
	Dry	Overnight	Hanging
	Potassium iodide	Greene III formula	2 min
	Exposure **23.6.11**	11:10 – 12:40 overcast, some sun	With blotter sprayed with water, covered with foil; very weak image, not whitened completely
	Fixer	Old, cold	
	Water		
055. Gampi A4 (on acetate)	Sodium Chloride	2%, with gelatine to	Brushed, dried (twice)

		stick paper to acetate	
Changing bag camera with 65 mm magnifying glass lens	Silver nitrate	10%	Glass rod
	Dry		
	Pre-exposure		Turned purple overall with one brown spot where most silver applied
	Water	1h, warm	Slipped off the acetate due to water being warm; repositioned
	Dry		Hanging
	Potassium iodide	Greene III formula	1 min
	Exposure **25.6.11**	9:00 – 19:00 overcast	With blotter sprayed with water, covered with foil; no image
	Fixer		
	Water		

Appendix 3. Talbot's developing-out direct positive photographic process used on-site in 'hole in the ground' cameras (Altes Spital, Solothurn, Switzerland, Sep – Nov 2011)

2x Hahnemuhle Bamboo ~A5 sheets, 4x Fabriano '5' ~25x25cm

Sensitizing 30.9.2011	Silver nitrate	10%, fresh, with distilled water	Applied with cotton swab
	Dry	Hot air dryer	
	Potassium iodide	4%, fresh, with tap water	2 min bath
	Water	Cold, 1 - 1.5h	Face down floating
	Dry		Hot air dryer
	Aceto-nitrate	6.5g sil.nit. + 60ml tap water (=10% sol.) + 10ml acetic acid + 1.3l tap water	2 min
	Pre-exposure	1min	3pm, misty
	(2 sheets waited 2 min in trays between aceto-nit. and pre-exp. – effectively they were 4 min in aceto-nit -> they darkened more)		
	Water	Cold, 1 – 1.5h	Face down floating
	Dry	Overnight	Hanging
	Inserted into black plastic photographic bags with tape affixed for putting the sensitized paper into hole in the ground, and pulling the bag out by the tape		

All holes for the cameras:
Dug in loose ground and rocks
Lens board positioned 25cm above the bottom of the hole (measured with a stick put through one of the holes for pouring chemicals in)
Paper in black bag inserted and nailed down to the bottom of the hole by two corners, hole covered, black bag put out
Lens board positioned for exposure and foil around it covered with stones to hold it down, light-proofing the hole, mirror fixed over the lens, which was the 58mm x4 magnifying lens fitted with an aperture of about f16 (13mm diameter)

HOLE I 1.10.2011	above Steingruben, above Im Holz and Oberdorf, north of Solothurn

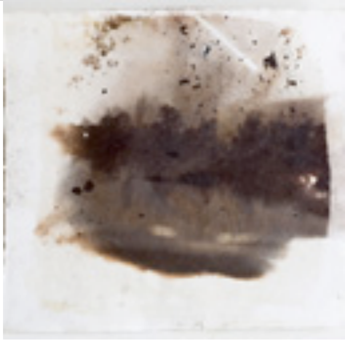
EXPOSURE I Hahnemuhle Bamboo	Potassium iodide	4%, left for 1-2 min	Sprayed with pressure spray bottle
	Exposure	14:00-15:00	Sunny
	Water	Hot	Poured through a cone, left for 1-2min
	Developer	375ml 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 5min (too long? – darkened a lot)
	Water	Cold, left 1-2min	Poured through a cone
	Fix	10% Silverfix 300-400ml	Sprayed with pressure spray bottle twice with 3-4min break in-between, and a third time after lifting the foil and lens board
	Water	Cold	Sprayed with pressure spray bottle repeatedly
	Allowed to dry lying on a rock		
At home:	Water	15-20min, around18:30	Immersed in a tray
	Dry	In a vertically positioned tray	

EXPOSURE II Hahnemuhle Bamboo	Potassium iodide	4%, left for 1-2 min	Sprayed with pressure spray bottle
	Exposure	16:00-17:00	Sunny
	Water	Cold	Poured through a cone, left for 1-2min
	Developer	375ml 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 5min (too long? – darkened a lot)
	Water	Cold, left 1-2min	Poured through a cone
	Fix	10% Silverfix 300-400ml	Sprayed with pressure spray bottle twice with 3-4min break in-between, and a third time after lifting the foil and lens board
	Water	Cold	Sprayed with pressure spray bottle repeatedly
	Put wet into black bag for transport		
At home:	Water	15-20min, around18:30	Immersed in a tray
	Dry	In a vertically positioned tray	

HOLE II	Partly dug but mostly adjusted between some rocks		
3.10.2011	Creux du Van, Kt. Neuchatel		

EXPOSURE III Fabriano '5'	Potassium iodide	4%, left for 1-2 min	Sprayed with pressure spray bottle
	Exposure	16:55-17:35 (too short and too late – underexposed)	Sunny
	Water	Hot	Poured through a cone
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2-3min
	Water	Cold	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle twice for a total of 5min
	Taken out of the hole		
	Water	Cold, 8 min	Immersed in a tray
	Transported wet in black bag		
At home:	Water		Immersed in a tray

HOLE III	Constructed from stones in an old fire spot (ground by the river too hard to dig)		
5.10.2011	Aare north bank towards Altreu, first clearing with bench after passing the island		

EXPOSURE IV Fabriano '5'	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	16:00-17:00	Sun in the lens, visible in print
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2min
	Water	Cold	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle twice, left for a few min
	Taken out of the hole		
	Water	Cold	Immersed in a tray
	Transported wet in black bag		
At home:	Fix	10% Silverfix	Immersed in a tray for 30min-1h until yellow tint disappeared
	Water	1-2h in two changes of water	Immersed in a tray

EXPOSURE V Fabriano ‘5’	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
11.10.2011	Exposure	17:00-18:10	Sun in the lens, on edge of print
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2-3min
	Water	Hot	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle and poured through a cone, 5min
	Taken out of the hole		
	Water	Aare river water	Immersed in a tray
	Transported wet in black bag		
At home:	Fix	10% Silverfix	Immersed in a tray for 30min
	Water		Immersed in a tray

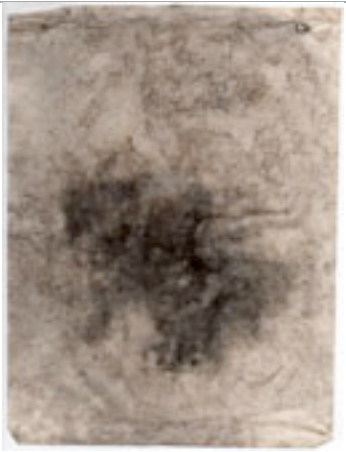
HOLE IV	Dug behind an old log, which was used to support the lens board. Earth soft but full of roots (paper not lying flat on the bottom).
12.10.2011	Aare south bank east of Solothurn (Feldbrunnen), at the level of sports fields Correcting the position of the paper after taking off the light-tight foil –> light leak.

EXPOSURE VI Fabriano ‘5’	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	16:10-17:40	Partly sunny
	Developer	~300ml, 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2min
	Water	Hot	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle and poured through a cone
	Taken out of the hole		
	Water	Aare river water	Immersed in a tray for 5 min
	Transported wet in black bag		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	2-3h in two changes of water	Immersed in a tray

12x Japanese Kozo sheets, 9x Khadi cotton sheets, 18 Khadi mitsumata washi (16x 20x13.5cm, 2x 20x26.5cm)

Gelatine sizing 5.10.2011	1½ leaf of gelatine in 170ml water Sized by stacking each on top of the previous ones and brushing; separated and hung on a metal drying rack		
Sensitizing 12-13.10.2011	Silver nitrate	10%, with distilled water	Applied with cotton swab
	Dry	Flat	Some might not have been totally dry before the next step
	Potassium iodide	4%, fresh, with tap water	2 min bath
	Water	Cold, 2 - 2.5h	Face down floating
	Dry	Overnight	Hanging folded in half
	Aceto-nitrate	6.5g sil.nit. + 60ml tap water (=10% sol.) + 10ml acetic acid + 1.3l tap water	2 min
	Pre-exposure	1min	10am, semi-cloudy
	Water	Cold, 2h	Face down floating
	Dry	Overnight	Hanging folded in half

HOLE I	Hole in perfect shape since last time used		
13.10.2011 above Steingruben, above Im Holz and Oberdorf, north of Solothurn	Procedure same as for HOLE I previous exposures		
EXPOSURE VII Kozo gelatine sized	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	15:30-17:10	Partly sunny
	Developer	~300ml, 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2.5min
	Water	Hot	Poured through a cone, 2min
	Fix	10% Silverfix	Sprayed with pressure spray bottle, 2min, and poured through a cone, 4min
	Taken out of the hole		
	Water	Cold	Immersed in a tray for 5 min
	No image visible, only stained paper – gelatine most likely dissolves in hot water processing Transported wet in black bag		

HOLE V	Dug in ashes of an old fire spot		
14.10.2011	almost opposite Attisholz, on left bank of the canal east of Emme river		
EXPOSURE VIII Mitsumata gelatine sized	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	14:20-15:20	Clear sky
	Developer	~300ml, 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2.5min
	Water	Hot	Poured through a cone, 2min
	Fix	10% Silverfix	Sprayed with pressure spray bottle, 2min, and poured through a cone, 4min
	Taken out of the hole. Transported wet in black bag		
At home:	Water	Cold	Immersed in a tray
	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray
	No image visible, only stained paper – gelatine most likely dissolves in hot water processing		

Test exposures carried out in 5x4 camera to see if cold developer works on gelatine-sized mitsumata paper

1.	Exposure	20-30min f8	Sun into lens
	Developer	Ilfosol3 in cold water	Later tray inserted into tray of warm water
	No image appeared		
2.	Exposure	25min f8	Sun into lens
	Developer	10% Ilford Multigrade in warm tap water	
	After a long time a non-contrasty image appeared, muddy and without details		

Japanese Kozo sheets, Khadi cotton sheets, Khadi mitsumata washi (not sized)

Sensitizing 16.10.2011	Silver nitrate	10%, with distilled water	Laid face down on a piece of acrylic board with some sil. nit. distributed over it

	Mitsumata paper turned deep reddish brown colour upon turning on a fluorescent light after applying sil.nit.		
	Dry	10min, not dried completely	Hanging
	Potassium iodide	4%, pre-used, with tap water	2 min bath; bath became very cloudy white/yellow (too much silver nitrate?)
	Water	Cold, 1:15h, changed once	Face down floating; water still cloudy
	Dry		Hanging folded in half
6 sheets:	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water	2 min; water also turned cloudy
	Pre-exposure	A few min, darkened very slightly	2:30pm, grey sky
	Water	Cold, 2.5h	Face down floating
	Dry		Hanging folded in half
2x Khadi cotton 26.10.2011	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water	2 min
	Pre-exposure	Darkened well	5:30pm, in setting sunlight
	Water	Cold, 1.5h	Face down floating
	Dry		Hot air dryer
Test exposures carried out in 5x4 camera – Kozo paper sensitized as above			
	1. Exposure	8min f4.7	
	Developer	10% Ilford Multigrade paper developer mixed with very hot water	Paper turned black immediately leaving some black bits floating in the bath (too hot)
	2. Exposure	2min f4.7	
	Developer	10% Ilford Multigrade – same as above but cooled down slightly	Turned brown fast No image on either one. Too much silver nitrate during sensitizing?
6x Hahnemuhle Bamboo ~A5 sheets, 4x Khadi cotton			
Sensitizing 16.10.2011	Silver nitrate	10%, with distilled water	Applied with cotton swab
	Dry	Hot air dryer	
	Potassium iodide	4%, fresh, with tap water	2 min bath

	Water	Cold	Face down floating
	Dry		Hanging or leaning
2 sheets:	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water – cloudy from the previous papers	2 min
	Pre-exposure	A few min	6pm, setting sun
	Water	Cold, 30-40min, water changed twice	Face down floating
	Dry	Overnight	Hanging
3 sheets: (1x Hahnemuhle, 2x Khadi cotton)	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water	2 min
	Pre-exposure	1 min	3pm, sunny
	Water	Cold	Face down floating
	Dry	Overnight	Hanging
1x Hahnemuhle, 1x Khadi cotton	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water	2 min
	Pre-exposure	A few min	5:30pm, setting sunlight
	Water	Cold, 1.5h	Face down floating
	Dry		Hot air dryer
HOLE VI	Dug in ashes and arranged between stones of an old fire spot		
17.10.2011	almost opposite Attisholz, on left bank of the canal east of Emme river		
EXPOSURE IX Hahnemuhle bamboo	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	16:55-17:50	Sunny, sun almost falling into the lens
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2min
	Water	Hot	Poured through a cone, 1-2min
	Fix	10% Silverfix	Sprayed with pressure spray bottle twice, a few min
	Taken out of the hole. Transported wet in black bag		
At home:	Water	Cold	Immersed in a tray
	Fix	10% Silverfix	Immersed in a tray, 15min
	Water	Cold	Immersed in a tray

HOLE VII	Dug almost at water level in sandy and grassy bank		
18.10.2011	opposite waste utilization plant where a stream flows into Emme		
EXPOSURE X Hahnemuhle bamboo	Potassium iodide	4%, left for 2-3 min	Sprayed with pressure spray bottle and poured through a cone
	Exposure	13:00-14:00	Sunny
	Developer	~300ml 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2min
	Water	Hot	Poured through a cone, 3min
	Fix	10% Silverfix	Sprayed with pressure spray bottle twice, a few min
	Taken out of the hole		
	Water	Floated face down on river for ½ min	
	Transported wet in black bag		
At home:	Water	Cold	Immersed in a tray
	Fix	10% Silverfix	Immersed in a tray, 30min
	Water	Cold	Immersed in a tray

HOLE VIII	Dug in sandy and grassy bank		
20.10.2011	opposite waste utilization plant where a stream flows into Emme, nearby HOLE VII		
EXPOSURE XI Khadi cotton	Potassium iodide	4%, left for 2-3 min	Sprayed with pressure spray bottle and poured through a cone
	Exposure	13:00-14:00	Sunny with some clouds
	Developer	~300ml 10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2min
	Water	Cold – from river	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle twice, a few min
	Taken out of the hole		
	Water	Floated face down on river	
	Transported wet in black bag filled with fixer for 20-30min; taken out and washed in river; transported between two clean sheets of foil		
At home:	Water	Cold	Immersed in a tray, water changed

HOLE V	Same hole as before, dug in ashes of an old fire spot		
20.10.2011	almost opposite Attisholz, on left bank of the canal east of Emme river		
EXPOSURE XII Hahnemuhle bamboo	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle and poured through a cone
	Exposure	14:40-15:40	Mostly sunny
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, hasn't covered the whole sheet
	Water	Hot	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle and poured through a cone
	Taken out of the hole		
	Water	Floated face down on the river	
	Transported wet in black bag filled with fixer for ~20min		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray

HOLE IX	Dug in a patch of bare ground without vegetation		
21.10.2011	Aare north bank towards Altreu, left after the bridge over Bülletsbach		
EXPOSURE XIII Kozo, not sized	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	14:45-15:30	Sunny, sun in the lens
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone
	Water	Cold, river water	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle
	Taken out of the hole		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer		
	No image, paper totally black. Kozo not suitable?		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray

Previous chemicals haven't drained completely, so hole dug deeper to remove them

EXPOSURE XIV Khadi cotton	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	16:00-16:45	Sunny, sun in the lens
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone
	Water	Cold, river water	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle
	Taken out of the hole		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray
	Hole made wider and deeper		
EXPOSURE XV Khadi cotton 22.10.2011	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	15:55-16:20	Sunny, sun and its reflection in water in the lens
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2 min
	Water	None	
	Fix	10% Silverfix	Sprayed with pressure spray bottle
	Taken out of the hole		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray
4x Baslermühle paper, 4x Khadi lokta (natural brown colour)			
Sensitizing 22.10.2011	Silver nitrate	10%, with distilled water	Applied with cotton swab
	Dry		
	Potassium iodide	4%, fresh, with tap water	2 min bath
	Water	Cold, 1h	Face down floating
	Dry		Hanging
2 sheets Baslermuhle paper, 1 sheet lokta paper	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water	2 min old solution (exhausted?)
	Pre-exposure	5min	11am, foggy paper hasn't darkened
	Water	Cold, 40-50min	Face down floating

	Aceto-nitrate AGAIN	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water – fresh	2 min
	Pre-exposure	15min	6pm, cloudy sunset paper darkened very slightly
	Water	Overnight 16h	Face down floating
	Dry		Hanging
2 sheets Baslermuhle paper	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water – fresh	2 min
	Pre-exposure	15min	6pm, cloudy sunset paper darkened very slightly
	Water	Overnight 16h	Face down floating
	Dry		Hanging
Test exposures carried out in 5x4 camera – lokta paper sensitized as above			
	Exposure	15min f4.7	After sunset, cloudless sky
	Developer	10% Ilford Multigrade paper developer mixed with warm-hot water	Paper turned black immediately – like Kozo paper, lokta is not suitable?
HOLE IX	Hole improved again, contaminated earth removed from the bottom		
EXPOSURE XVI Khadi cotton 22.10.2011	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	16:40-17:10	Sunny, sun and its reflection in water in the lens
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2 min
	Water	Hot	Poured through a cone, left for 2 min
	Fix	10% Silverfix	Sprayed with pressure spray bottle
	Taken out of the hole		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray

EXPOSURE XVII Hahnemuhle bamboo 24.10.2011	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	15:45-16:45	Mostly sunny
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone
	Water	Cold, river water	Poured through a cone
	Fix	10% Silverfix	Sprayed with pressure spray bottle
	Taken out of the hole		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray

	Hole re-shaped for the lens to face diagonally		
EXPOSURE XVIII Baslermuhle paper 26.10.2011	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	13:30-14:30	Sunny
	Developer	<10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone
	Water	Hot, and cold river water	Poured through a cone
	Fix	10% sodium thiosulphate ‘hypo’	Sprayed with pressure spray bottle
	Taken out of the hole Print not darkened much, no deep blacks – developer too weak or pre-exposure not enough or change of fixer not beneficial?		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer 1.5h		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray

EXPOSURE XIX Hahnemuhle bamboo 26.10.2011	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	14:45-15:45	Sunny
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, hasn't darkened much
	Water	Hot	Poured through a cone
	Fix	10% sodium thiosulphate 'hypo'	Sprayed with pressure spray bottle
	Taken out of the hole Print not darkened much, no deep blacks – change of fixer not beneficial or exposure too long (unlikely)?		
	Water	Floated face down on the river, 10s	
	Transported wet in black bag filled with fixer 1.5h		
At home:	Fix	10% Silverfix	Immersed in a tray
	Water	Cold	Immersed in a tray

9x Khadi cotton			
Sensitizing 26.10.2011	Silver nitrate	~10%, with distilled water	Applied with cotton swab
	Dry	10min, not totally dried	Lying
	Potassium iodide	4%, fresh, with tap water	2 min, face down mostly without wetting the back
	Water	Cold, 1h	Face down floating
	Dry		Hanging
	Half of the sheets have uneven coating and some blemishes or stains - cotton swab sensitizing not good for this paper or done too violently?		
8 sheets: 29.10.2011	Aceto-nitrate	65ml of 10% sol. silver nitrate + 10ml acetic acid + 1.3l tap water – pre-used	2 min
	Pre-exposure	A few min	5pm, sunny, paper not in direct sunlight
	Water	Cold	Face down floating
	Dry		Hanging

HOLE X	Dug in a patch of bare ground without vegetation, granite stones from a nearby fire site used to raise the lens board. Depth of hole greater than usual.
29.10.2011	Aare north bank towards Altreu, further west that HOLE IX, under a big oak tree

EXPOSURE XX Hahnemuhle bamboo	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	12:30-13:30	Mostly sunny
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2-3min
	Water	Hot	Poured through a cone
	Fix	~5% Ilford Rapid Fix	Sprayed with pressure spray bottle, twice
	Taken out of the hole		
	Transported wet in black bag filled with fixer for 1h		
	Water	Floated face down on the river, 10s	
At home:	Water	Cold, changed twice	Immersed in a tray

HOLE XI	Dug in ashes of an old fire site, granite stones used to raise the lens board.		
29.10.2011	Aare north bank towards Altreu, 20m further west that HOLE X, by a bench		
EXPOSURE XXI Khadi cotton (from those sensitized by lying face down on sil.nit.)	Potassium iodide	4%, left for 2 min	Sprayed with pressure spray bottle
	Exposure	14:20-15:10	Mostly sunny, but the scene mostly in shade
	Developer	10% Ilford Multigrade paper developer mixed with hot water	Poured through a cone, left for 2-3min
	Water	Hot	Poured through a cone
	Fix	~5% Ilford Rapid Fix	Sprayed with pressure spray bottle
	Taken out of the hole		
	Transported wet in black bag filled with fixer		
	Water	Floated face down on the river, 10s	
At home:	Fix	~5% Ilford Rapid Fix, same as above	Immersed in a tray, 1h
	Water	Cold, changed twice	Immersed in a tray

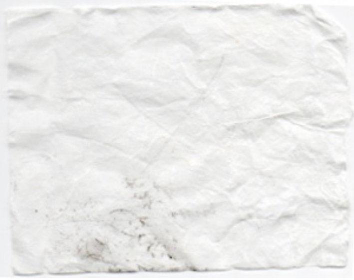
Appendix 4. Paper sizing tests for use with direct positive photographic processes (Newcastle, Feb 2012)

Done with the intention of possibly making own papers from the same or similar fibres.

Including papers that were unsuccessful before when used with the adapted procedure for the direct positive process (appendix 4) – mitsumata (40gsm, Khadi), lokta (30gsm, natural colour, Khadi), Kozo Unryu (Zurich art shop), Japanese sumi-e paper in a roll.

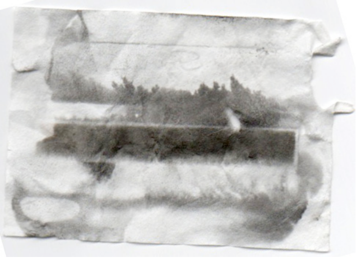
In the tests papers were not exposed in camera but under the UV unit with a strip of thick paper placed over them and contact-printed. In images resulting from a direct positive process this strip appears black, while the rest of the paper is white.

Sizing 7.2.2012	**STARCH**	2.5% solution: 12.5g rice starch dissolved in 100ml cold water, added to 400ml boiling water, boiled for a few minutes (recipe from: Reed & Jones(2001); although Greene advices to use a solution no stronger than 1%)	Heated to 30-40ºC, papers **immersed** for 1min
	Dry	Hanging	
	Silver nitrate	10%	Applied with **cotton swab** (2 sheets) or **sprayed** (2 sheets)
	Dry	Flat	
	Pot. iodide	4%, floated face down	2min
	Water	Cold, floated face down	1 - 2h
	Dry	Hanging	Overnight
8.2.2012	Aceto-nitrate	30ml of 10% silver nitrate solution + 5ml acetic acid + 0.65l tap water	2 min
	Pre-exp.	Under UV unit	45 s
	Water	Cold, floated face down	1 – 1.5h
	Dry	Hanging	
	Pot. iodide	4%, floated face down	2min
	Exposure	Under UV unit	5min

1) Kozo paper 	(1st batch processed)[1] Developer	PQ Universal 1+9 ~40-45ºC (temp. measured; dish placed in a larger tray of hot water)	5-6min, image appeared but paper also began to blacken all over (the effect of fresh developer?)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock	15min, image disappeared = paper bleached, fixer too strong
	Water		1-2h

Developer and fixer work best when slightly ‘used’, otherwise their action is too strong. I could try adding some ‘old brown’ (a term of Tim Rudman – he adds some exhausted developer when lith printing).

Oriental papers, being more delicate (and less sized) than western ones, seem to react more strongly to fresh developer and strong fixer. They need to be monitored particularly close when processed. Exact optimal temperatures and concentrations need to be tested further.

2) sumi-e paper 	(4th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	4min (image started appearing after ~2min)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about 1:2 with cold water	~10min
	Water		1-2h
3) mitsumata paper 	(7th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	3min (other than the strip there are imprints of the tray in which the paper was exposed)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about 1:1 or 1:2 with cold water	~10min
	Water		1-2h

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[1] The batch number indicates how ‘used’ were the chemical baths at the time of processing each sheet.

Sizing 7.2.2012	**STARCH + silver nitrate 10%**	Prepared as above; mixed with sil.nit. 1:1	Starch at ~30ºC, mixture **sprayed** onto paper
	Dry	Flat, then hanging	
	Pot. iodide	4%, floated face down	2min
	Water	Cold, floated face down	1 - 2h
	Dry	Hanging	Overnight
8.2.2012	Aceto-nitrate	30ml of 10% silver nitrate solution + 5ml acetic acid + 0.65l tap water	2 min
	Pre-exp.	Under UV unit	45 s
	Water	Cold, floated face down	1 – 1.5h
	Dry	Hanging	
	Pot. iodide	4%, floated face down	2min
	Exposure	Under UV unit	5min
1) mitsumata paper 	(3rd batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	~3min (image started appearing after ~1-2min); other than the strip itself there are marks of the folds of the paper in processing
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about 1:2 with cold water	~10min
	Water		1-2h
2) Kozo paper 	(4th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	3min (image started appearing after ~1-2min)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about 1:2 with cold water	~10min
	Water		1-2h
3) lokta paper	(5th batch processed) Developer	PQ Universal as above with some hot water and stock solution added	5min

		continuously dilution approx 1:15 ~50ºC (temp. not measured)	
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about 1:2 with cold water	2min
	Water		1-2h

Starch sizing seems to work very well, especially when applied together with silver nitrate.

Sizing 7.2.2012	**GELATIN**	5% solution: 5g food gelatin dissolved in 100ml warm water, dish placed in larger tray of hot water, 2ml of chrome alum added (from 'Silverprint subbing and hardening solution'); (solution strength between 4.4% advised by Reed & Jones (2001) and up to 6.5% by Japanese manuals (www.woodblock.com)	Papers **immersed** for 1min
	Dry	Hanging	
	Silver nitrate	10%	Applied with **cotton swab** (2 sheets) or **sprayed** (2 sheets)
	Dry	Flat	
	Pot. iodide	4%, floated face down	2min
	Water	Cold, floated face down	1 - 2h
	Dry	Hanging	Overnight
8.2.2012	Aceto-nitrate	30ml of 10% silver nitrate solution + 5ml acetic acid + 0.65l tap water	2 min
	Pre-exp.	Under UV unit	45 s
	Water	Cold, floated face down	1 – 1.5h
	Dry	Hanging	
	Pot. iodide	4%, floated face down	2min
	Exposure	Under UV unit	5min

1) sumi-e paper (sil.nit. sprayed?) 	(1st batch processed) Developer	PQ Universal 1+9 ~40-45ºC (temp. measured; dish placed in a larger tray of hot water)	5-6min, image appeared but paper also began to blacken all over (the effect of fresh developer?)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock	15min, image disappeared = paper bleached, fixer too strong
	Water		1-2h
2) mitsumata paper (sil.nit. applied with cotton swab?) 	(1st batch processed) Developer	PQ Universal 1+9 ~40-45ºC (temp. measured; dish placed in a larger tray of hot water)	5-6min, no image noted; paper began to blacken all over (the effect of fresh developer?)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock	15min, image disappeared = paper bleached, fixer too strong
	Water		1-2h
3) lokta paper (sil.nit. sprayed?) 	(7th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	4-5min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about 1:1 or 1:2 with cold water	~10min
	Water		1-2h
4) Kozo paper (sil.nit. applied with cotton swab?) 	(8th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	5min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~ 1:2 cold water	~10min
	Water		1-2h

Sizing 7.2.2012	**GELATIN**	Prepared as above	**Sprayed** (gelatine foams when sprayed)
	Dry	Flat	Stuck to the surface, had to be torn away, causing some damage; not yet completely dry
	Silver nitrate	10%	**Sprayed**
	Dry	Hanging and with hair dryer	
	Pot. iodide	4%, floated face down	2min
	Water	Cold, floated face down	1 - 2h
	Dry	Hanging	Overnight
8.2.2012	Aceto-nitrate	30ml of 10% silver nitrate solution + 5ml acetic acid + 0.65l tap water	2 min
	Pre-exp.	Under UV unit	45 s
	Water	Cold, floated face down	1 – 1.5h
	Dry	Hanging	
	Pot. iodide	4%, floated face down	2min
	Exposure	Under UV unit	5min
1) sumi-e paper (no image – paper disintegrated during processing)	(6th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	6min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~1:2 cold water	~10min
	Water		1-2h paper disintegrated completely
2) Kozo paper 	(8th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	5min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock	~10min

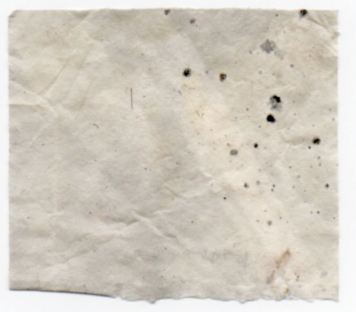
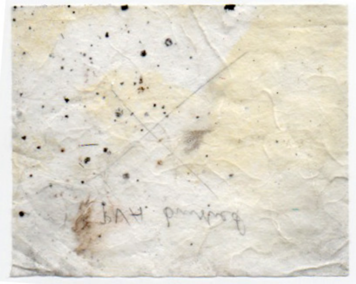
		diluted about 1:2 with cold water	
	Water		1-2h
3) mitsumata paper 	(8th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	5min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~1:2 cold water	~10min
	Water		1-2h

Sizing 7.2.2012	**GELATIN + silver nitrate 10%**	Prepared as above; mixed with sil.nit. about 1:1	Gelatin at ~30ºC, mixture **sprayed** onto paper (gelatine foams when sprayed)
	Dry	Flat, then hanging	
	Pot. iodide	4%, floated face down	2min
	Water	Cold, floated face down	1 - 2h
	Dry	Hanging	Overnight
8.2.2012	Aceto-nitrate	30ml of 10% silver nitrate solution + 5ml acetic acid + 0.65l tap water	2 min
	Pre-exp.	Under UV unit	45 s
	Water	Cold, floated face down	1 – 1.5h
	Dry	Hanging	
	Pot. iodide	4%, floated face down	2min
	Exposure	Under UV unit	5min
1) mitsumata paper 	(1st batch processed) Developer	PQ Universal 1+9 ~40-45ºC (temp. measured; dish placed in a larger tray of hot water)	5-6min, image appeared but paper also began to blacken all over (the effect of fresh developer?)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock	15min, image disappeared = paper bleached, fixer too strong

	Water		1-2h
2) lokta paper 	(3rd batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	~3min (image started appearing after ~1-2min)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~1:2 cold water	~10min
	Water		1-2h
3) Kozo paper 	(8th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC	5min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~1:2 cold water	~10min
	Water		1-2h

Gelatin sizing seems to be working best when applied together with silver nitrate, although every time gelatin is sprayed, it foams and the bubbles interrupt even distribution of the sensitizer. Also works reasonably well when papers immersed in gelatin.

Sizing 7.2.2012	**PVA glue**	Undiluted	**Brushed**
	Dry	Hanging	
	Silver nitrate	10%	**Sprayed**
	Dry	Flat	
	Pot. iodide	4%, floated face down	2min
	Water	Cold, floated face down	1 - 2h
	Dry	Hanging	Overnight
8.2.2012	Aceto-nitrate	30ml of 10% silver nitrate solution + 5ml acetic acid + 0.65l tap water	2 min
	Pre-exp.	Under UV unit	45 s
	Water	Cold, floated face down	1 – 1.5h
	Dry	Hanging	
	Pot. iodide	4%, floated face down	2min
	Exposure	Under UV unit	5min

1) mitsumata paper 	(2nd batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC (temp. not measured)	No image after 10min, only black dots in the paper; the faint white strip suggests that the paper hasn't reversed (PVA reacts with the photo chemistry?)
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~1:2 cold water	~10min
	Water		1-2h
2) Kozo paper 	(2nd batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC	No image after 10min, only black dots in the paper
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted ~1:2 cold water	~10min
	Water		1-2h
3) lokta paper 	(5th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC	No image after 10min, some fresh hot dev. added, without results, taken out after 12min total
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted 1:2 cold water	2min
	Water		1-2h
4) sumi-e paper 	(6th batch processed) Developer	PQ Universal as above with some hot water and stock solution added continuously dilution approx 1:15 ~50ºC	6min
	Stop	SB50 1+19	30s
	Fixer	Ilford 2000RT stock diluted about ~1:2 with cold water	~10min
	Water		1-2h

PVA sizing doesn't seem to work well for photographic applications, even though it is recommended for sizing paper as such. It seems to impede chemical reactions and cause black spots to appear.

Appendix 5. Japanese paper (washi) making workshop with Caterina Dorello in Fabriano paper museum, Italy (Aug 2011), during the European paper mills research trip

The workshop took place between 19 – 21 August 2011 in the Fabriano paper museum. In August that year I have visited 12 European paper mills (Basel, Switzerland; Steyrermühl, Austria; Homburg am Main, Germany; Bergisch Gladbach, Germany; Düren, Germany; Moulin de Fleurac, France; Angouleme, France; Moulin du Verger, France; Moulin Valis Clausa, France; Amalfi, Italy; Fabriano, Italy; Zaandam, The Netherlands). A full report of the research trip is available in the Paper Studio Northumbria, including paper samples. I have also attended a workshop with papermaker Gangolf Ulbricht in Berlin, Germany, 14 – 18.12.2011, entitled ‘Identifying historical papers’.

The workshop with Caterina Dorello was particularly significant for the development of this research as it gave me hands-on experience of the process of producing paper from raw plant fibres that I later translated into my own experiments with making paper from a variety of local plants. These in turn have led to producing paper on-site in remote locations from materials available there. The workshop has also alerted me to the many variables of the process that influence the finished sheet of paper, including the time of cooking the fibres, the time of beating the pulp, the temperature of the water in which paper is screened, the humidity and sunlight when drying it, etc. I have been immersed in this world of materials with guidance of Caterina, who has been studying and practicing the art of Japanese papermaking since 1983, working for many years with some of the most famous master papermakers in the town of Ogawamachi.

Different types of Kozo (mulberry) fibres. Both the fibre with the green, inner layer of bark still present (probably wild-grown mulberry), as well as the white type (probably cultivated mulberry) was used in the workshop. In both cases the branches have been stripped of their outer bark after steaming them and then dried.

Left and right: Other fibres (not used in the workshop) - mitsumata.

Left and right: Other fibres (not used in the workshop) - gampi.

Above: materials for the course.

Right and below: Cooking the whiter type of mulberry fibres with lye (sodium bicarbonate, in a proportion of 20% of the dry fibre weight) to remove starch, fat and tannin. 1 kg of fibre needs about 15 litres of water. Cooking time is about 2-3 hours. The fibres must be soaked beforehand for at least a few hours.

Left: Taking the fibres out of the pot. The fibres are cooked sufficiently when a strip of fibre can be pulled apart. The heat is then turned off, the pot covered with a lid and allowed to sit for another 3-4 hours.

Right: washing the fibres in running water to remove the lye. The tub should be filled with water and drained at least three times. The more washing, the whiter and softer the paper.

The whiter type of fibres before (left) and after (right) picking out the impurities.

Top left: cooking the darker type of mulberry fibres used and checking their softness. Because they were wild rather than cultivated, and harvested a relatively long time ago, they were harder than the fibres of the cultivated whiter type and required longer cooking time.
Top right and the row below: washing the fibres in running water.

Left: the fibres after washing. Right: Picking out the impurities by hand (especially the remains of the outer dark bark clearly visible in the left photograph).

The two types of Kozo, after picking out the impurities: whiter type of fibre on the left and darker on the right. Water should be squeezed out of the fibres, which are then put upon a hard, clean surface for beating.

Beating the whiter type of fibre. One or two hardwood sticks are used, and the fibre is beaten for 20-30min. Hand-beating is rare nowadays, since mechanical stampers and the ‘naginata’ beater are more efficient. The quality of the fibre can be judged by its texture.

Left: the whiter type of fibre after beating. Right: to check for the right degree of beating the pulp a small amount is mixed in water – all or nearly all the individual fibres should be separated and free standing in water.

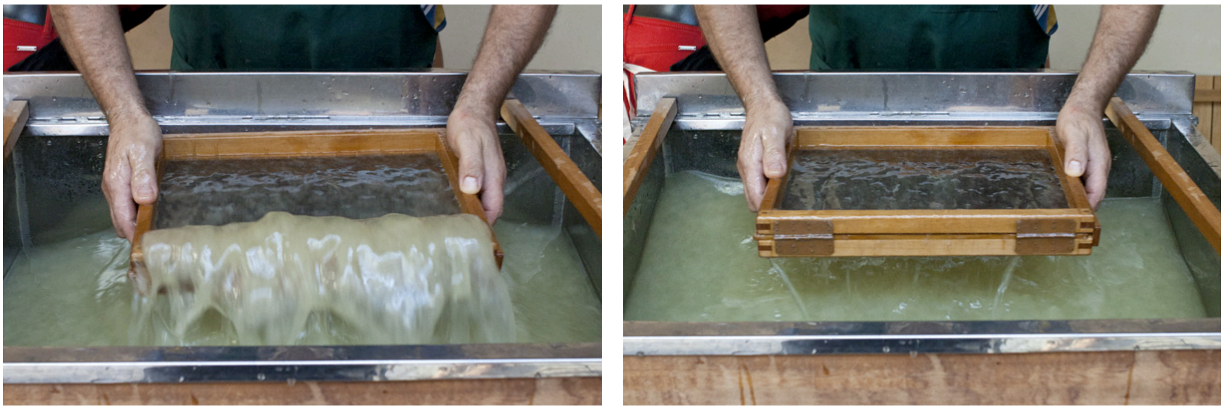
The darker type of fibre before beating (left), being beaten (right) and after beating (below). (This fibre was not used for making paper during the workshop.)

An original Japanese vat (left) and screen (right) that Caterina had ordered to be made for her in Japan in the 1990s. The craft skills needed for the production of traditional equipment are slowly dying out together with the older generation.
Screens are made from very finely cut bamboo (not visible in the photo) and have to be kept immersed in water so that they do not change shape. Similarly, vats, which are usually wooden throughout, are used continuously – in this case, the vat is for occasional use and so it was fitted with a metal lining in order for the wood not to change shape when repeatedly soaking up water and drying.

Dissolving the pulp evenly in the vat requires vigorous stirring with a bamboo rod.

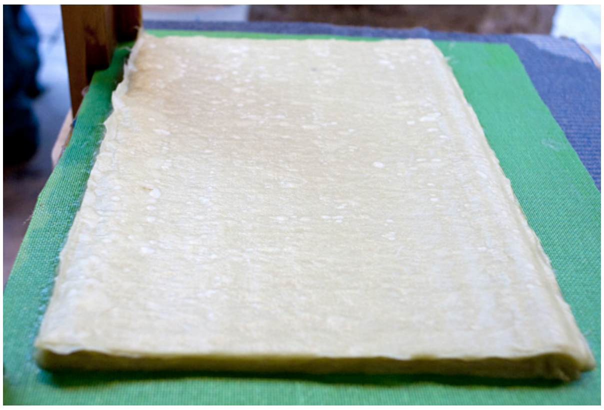
A suspension-aid, neri is dissolved in water and added to the vat. Neri is traditionally made from the roots of a tororo plant (Hibiscus manihot). Nowadays, and in this workshop, a powdered synthetic tororo is used. The right amount is judged by an experienced papermaker on the basis of the sound the pulp in the vat makes when agitated – neri changes its consistency from watery to a more mucous-like. This retards the drainage through the papermaking screen and is essential to the 'nagashizuki' (flowing style) action of sheet forming.

Right: traditional sieve for straining tororo.



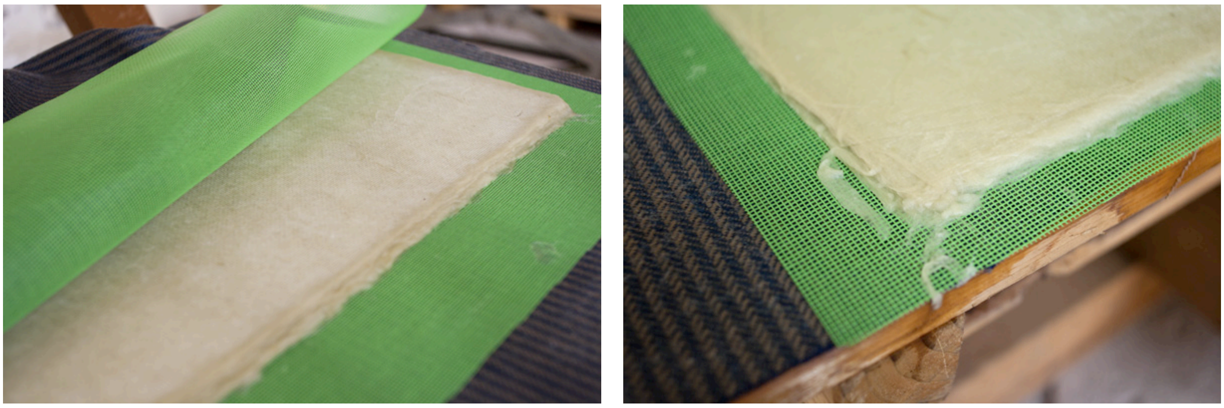
Above and left: screening a sheet of washi. A charge of slurry is picked up and flung across the screen, front to back. This first scoop creates the face of the sheet and is called ‘kesho mizu’ (cosmetic water). The following scoops are done more slowly, the liquid kept in constant motion. Each scoop adds a layer of fibre until the desired thickness is obtained. At the end, the water is allowed to drain from the screen.

The flexible bamboo screen (‘su’) is taken off the frame (‘geta’ – the two together being called ‘su-geta’) and each fresh sheet is couched onto a pile, without felts or any other material in-between them. First, the edge of the screen has to be positioned in line with the previous sheets, then it is slowly lowered onto the pile, maintaining a slight curve as it touches the sheet below. Finally, the far edge is pressed into the pile and pulled away with a sharp movement, leaving the sheet on the pile. The screen is slowly removed.



Left: the finished pile of screened sheets before pressing. Water is allowed to drain gradually from the post of sheets by leaving it to sit for a few hours with a weight on top (a bucket of water is about the correct weight).

Right: traditional Japanese press. The pressure is increased gradually for 40 minutes or until enough water is removed so that the pack can be handled safely.



The pile of sheets after being pressed. The addition of tororo to the pulp prevents sheets from sticking together in the press. Often just before separating the sheets the whole pack is moistened.

The sheets are carefully separated one by one.

The sheets are brushed onto a wooden board for drying. Any hard surface is suitable for drying, but a well-used wooden board is preferred because of the pleasant appearance it lends to the paper. The face of the sheet - the side that was against the screen - goes in contact with the drying board. This is usually done with the boards positioned vertically, a sheet held against the board with a brush at the ready to adhere one corner to the board. The brush is then brought down diagonally across the sheet in one stroke. This is followed by bushing the remaining corners, finishing with the remaining areas, always moving from the centre of the sheet to the edges. The pressure is firm but gentle.

The traditionally used brush, made of rice straw, is very hard and leaves marks on the sheets (visible much more on a moist sheet than after drying), but also makes them adhere tightly to the board. We also used a soft brush, which doesn't have such a good effect.

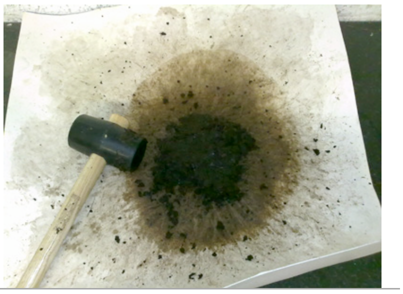
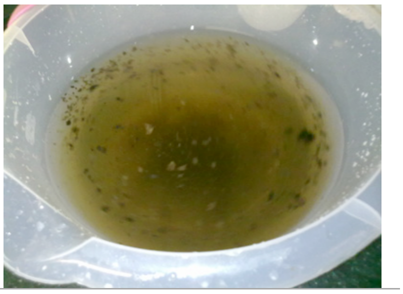
The sheets are dried on boards in the sun. They are completely dry within 10-20 min and can be taken off by pulling away by one corner. The sound this makes is an indication of the quality of the sheet and the conditions of its making (for example, paper made in cold drying conditions has a crispy sound).

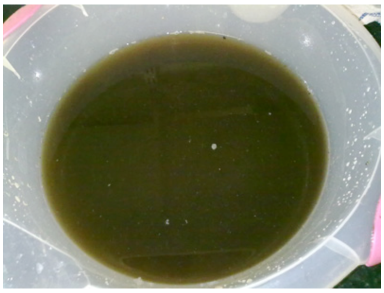
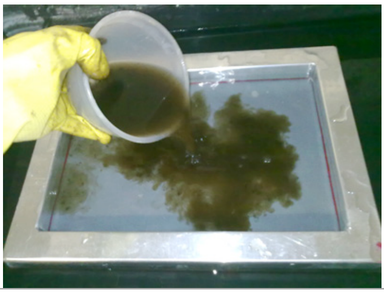
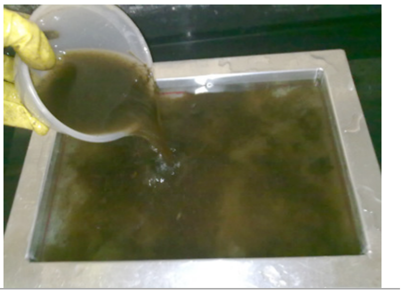
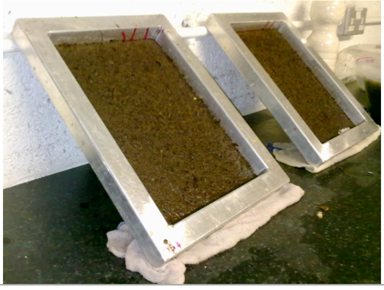
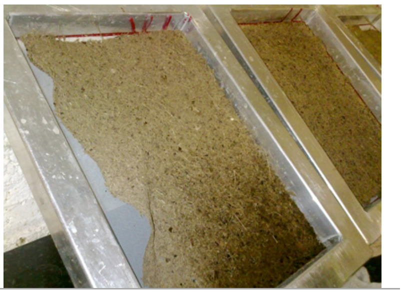
The structure of the wooden boards is visible in the structure of the sheets, which is a characteristics very much admired by the Japanese. Nowadays, a lot of paper is dried on metal heated surfaces, which provide a controlled drying environment independent of the weather. These produce smooth-surfaced paper.

Appendix 6. Papermaking tests using a variety of plants (Newcastle, Feb – May 2012)

Following directions from Watson (1991) and Shannon (1987).

Old leaves **10-13.2.2012** **3 A4 sheets**

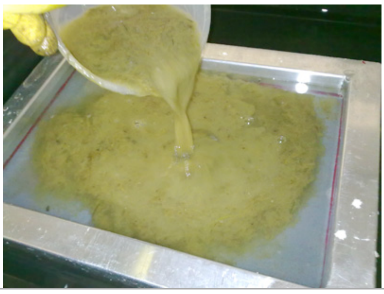
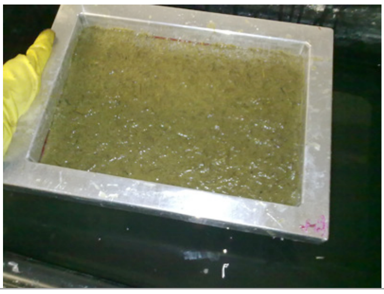
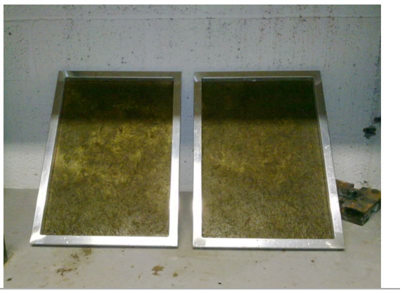
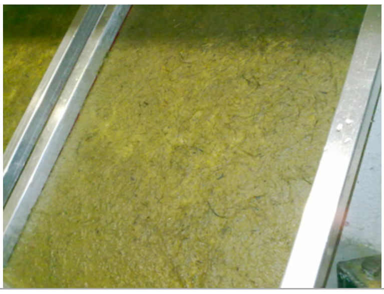
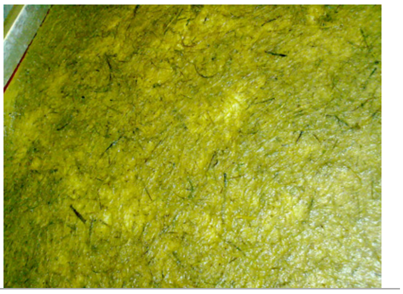
Collected from a park (moist)			
Stalks cut away			
Cooked with sodium carbonate (washing soda) ~2 spoons in 3l of water	2h		
Soaked in a fresh solution of 2 spoons of sodium carbonate in 3l of water	2.5 days	Leaves still don't feel like broken down when tested through a rubber glove	
Washed in running water in a sieve immersed in a bucket of water			
Beaten with a rubber mallet on blotting paper	1h		
Suspended in water		Don't suspend very well, either floating on the surface or sinking to the bottom	

		
Formation aid (unspecified; from Gangolf Ulbricht; doesn’t behave like formation aid – no ‘stringiness’; it was probably internal sizing)	~50ml	
Poured into immersed mould, distributed evenly by mixing by hand		
Mould lifted, left to drain propped diagonally		
	 front of a dry sheet	 back of a dry sheet
Sizing	Rice starch: ? g dissolved in some cold water and added to 400ml of boiling water, boiled for min. Sprayed onto dry paper once cold. Paper dried flat.	
Sensitizing for photographic exposure	Paper very fragile, breaks down in long baths into small fragments; soaks up a lot of liquid, thus making it difficult to wash chemicals out. Unsuitable.	

Old grass 13.2.2012 - 1 small and 2 large sheets

Collected from	Should have cut it into

the garden (mostly old, dry grass)		short pieces before cooking	
Cooked with sodium carbonate (washing soda) ~4 spoons in 3l of water	1.5h	Feel slightly soft and slippery when tested through a rubber glove	
Washed in running water in a sieve immersed in a bucket of water, and freely in a bucket of water			
Beaten with a rubber mallet on blotting paper	30min	The pieces of grass that were most green were quickly beaten into a pulp, while the thick old pieces remained	After 10min:  after 20min:  after 30min: 
Run through a liquidiser in batches	10-30s	The liquidiser didn't really cut the fibres; part of the fibres cut with scissors before liquidising	

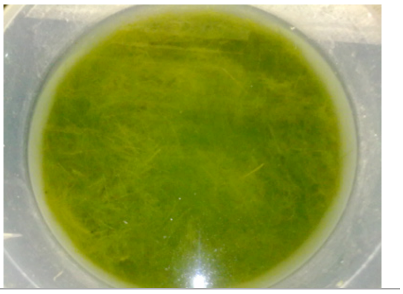
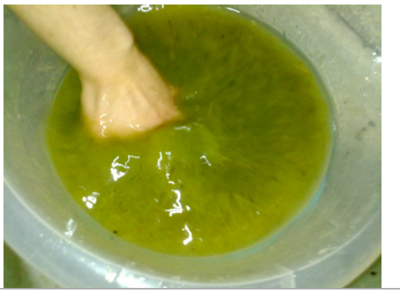
Suspended in water		Suspended quite well, except for the very dry pieces of grass matter	
Formation aid (unspecified; from Gangolf Ulbricht; doesn't behave like formation aid – no 'stringiness'; it was probably internal sizing)	~50ml		
Poured into immersed mould, distributed evenly by mixing by hand			
Mould lifted, left to drain propped diagonally			
[wet sheets]			
[dry sheets – amount of shrinkage visible; the shrinkage only occurred when the white substance (possibly internal sizing) was added]			

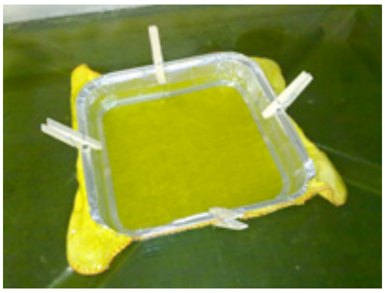
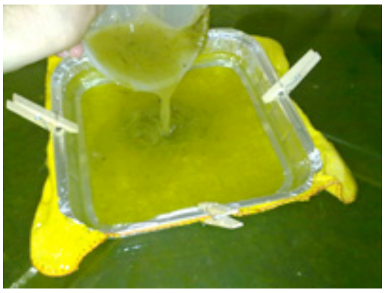
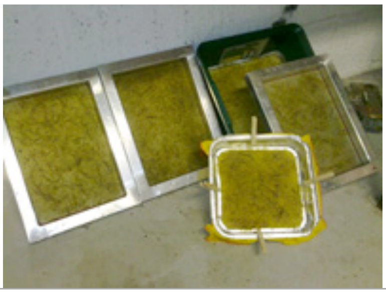
[front = screen side] [back = rough, non pressed side]		 Front of the 1st A3 sheet	 Back of the 1st A3 sheet
		 Front of the 2nd A3 sheet	 Back of the 2nd A3 sheet
Sensitizing for photo exposure		Paper holds together very well, esp. thicker sheets.	

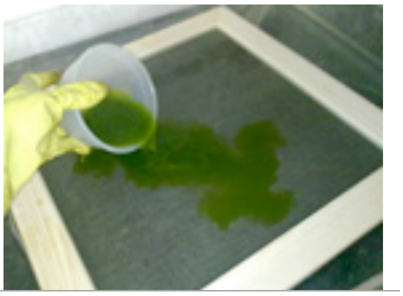
Incorporating directions from Hiebert (soaking 24h before cooking), Lockie (hydrogen peroxide for lightening fibres) and Dawson (both of the above):

Delicate tussock grass (collected on 21.2.2012)

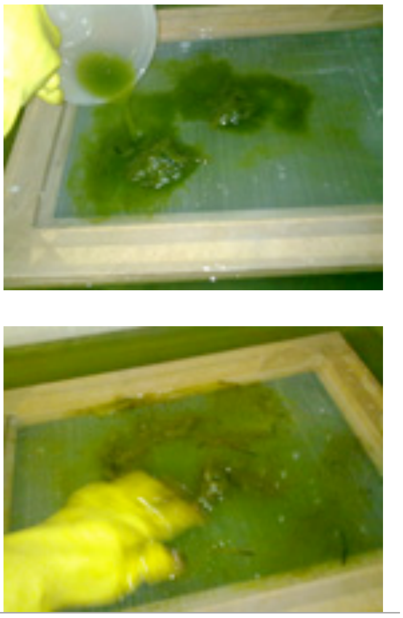
Collected from the wild meadow behind the house; about half-dry and half-green			
Soaked 6h			
Cut into 5-8cm pieces			
Cooked with 26g sodium carbonate (washing soda) in 3l of water	1.5h		
Left in the cooking water	24h		
Washed in running water in a sieve immersed in a bucket of water	15-30min		
Beaten with a rubber mallet on	10min	Pulp went mushy very quickly	After 10min:

packing paper		
Suspended in water		
Put in 4l water 5 days with 2 capfuls of hydrogen peroxide 6%	For bleaching, according to Lockie (2001) Left: colour after 4 days (not much colour change observed – compare with above)	
Formation aid mixed in (okra) Okra extract: 300g frozen okra soaked 2 days to make 1.5l		
	Notice the improved distribution in water after adding formation aid	
Poured into immersed mould, distributed evenly by mixing by hand:		
MOULD TEST 1: garden sieve with sculpture aluminium mesh fitted		

MOULD TEST 2: two aluminium disposable dishes with bottoms cut out and cotton dust cloth stretched between them		
Mould lifted, left to drain propped diagonally		
[dry sheets]	 Front of an A4 sheet	 Back of an A4 sheet
Sensitizing for photo. exposure	Paper holds together very well, esp. thicker sheets.	
Broad-leafed tussock grass (collected on 21.2.2012)		
Collected from the wild meadow behind the house; about half-dry and half-green		
BATCH 1:		
Soaked 2 days		
Cut into 5-8cm		

pieces			
Cooked with 27g sodium carbonate (washing soda) in 3l of water	1.5h		
Left in the cooking water	Over-night		
Cooked again in same liquid	0.5h	Total cooking time: **2h**	
Washed in running water in a sieve immersed in a bucket of water	15min		
Beaten with a rubber mallet on wooden board paper	20min	Fibres with defined structure before beating, with fibres broken down sufficiently after 20min of beating	After 10min:  after 20min: 
Suspended in water		Suspends relatively well, although clumps of pulp difficult to untangle	
Poured into immersed mould, distributed evenly by mixing by hand		MOULD TEST 3: A mould made of artist's canvas stretcher bars and raw linen cloth pinned to it	

MOULD TEST 4: A mould made with sculpture aluminium mesh with relatively large mesh squares taped to a wooden frame

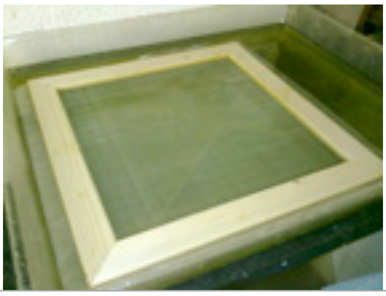
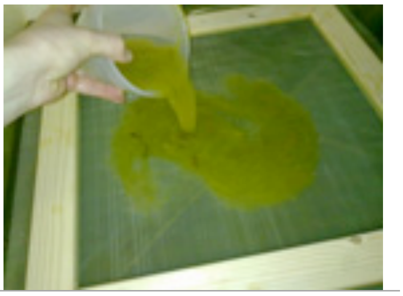


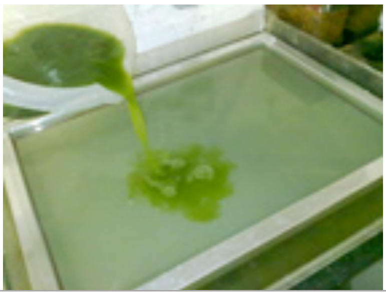
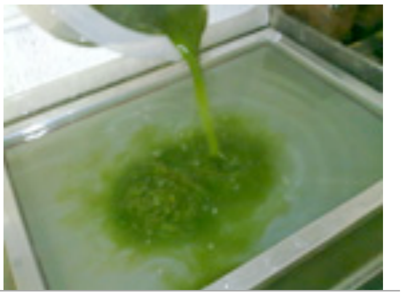
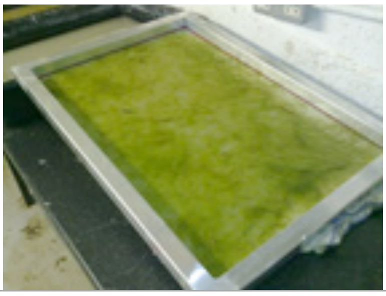
Mould lifted, left to drain first flat, then propped diagonally

[wet sheets]

Taking sheets off the frames: problems with separating paper from linen fabric make the mould unsuitable

[dry sheets]		 Front of an A4 sheet	 Back of an A4 sheet
Sized with rice starch (sprayed on the rough side of sheets); dried flat			
Sensitizing for photo. exposure		Paper holds together very well, esp. thicker sheets.	
BATCH 2:			
Soaked 2 days			
Cut into 5-8cm pieces			
Cooked with 27g sodium carbonate (washing soda) in 3l of water	1h		
Left in the cooking water	Over-night		
Cooked again in same liquid	1:30h	Total cooking time: **2:30h**	
Washed in running water in a sieve immersed in a bucket of water	15min	 beginning of washing: notice the dark colour of the cooking liquid	 end of washing: water flows out clear
Beaten with a rubber mallet on wooden board paper	13min	Fibres softer than batch 1, falls apart more in washing and easier to beat – quickly turns mushy Comparison of batch 1 on the left and batch 2 on the	After 13min:

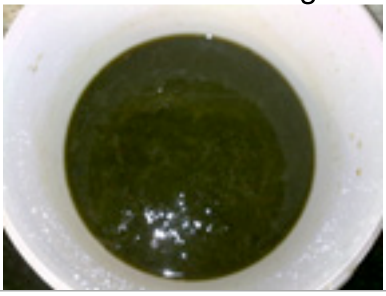
	right after beating: 	
Put in 2l water 4 days with 2 capfuls of hydrogen peroxide 6%; not much difference in colour observed	Colour before soaking 	Colour after 4 days 
Formation aid mixed in (okra) Okra extract: 300g frozen okra soaked 2 days to make 1.5l		
Poured into immersed mould, distributed evenly by mixing by hand:		
MOULD TEST 5: artist's canvas stretcher bars with sculpture aluminium mesh pinned to it		
[dry sheets]	 Front of a 36x36cm sheet	 Back of a 36x36cm sheet
BATCH 3:		
Soaked 6 days	FERMENTED	
Washed in running water		

Cut into 5-8cm pieces			
Cooked with 10g sodium carbonate (washing soda) in 1.8l of water	1h	(fermentation is said to shorten the necessary cooking time)	
Left in the cooking water	1h		
Washed in running water in a sieve immersed in a bucket of water	10min		
Beaten with a rubber mallet on wooden board paper	8min	Was very easy to beat despite short cooking time; consistency seemed different than in previous batches – more fibrous, and adhering to the board	After 8min: 
Formation aid mixed in (okra) Okra extract: 300g frozen okra soaked 2 days to make 1.5l			
Poured into immersed mould, distributed evenly by mixing by hand			
Mould lifted, left to drain first flat, then propped diagonally			

[dry sheets]		 Front of an A3 sheet	 Back of an A3 sheet

Iris-like plant growing in a wet shady area (collected on 21.2.2012)

Collected by the path from the house up to Byker; green, with decomposing brown fragments			
Soaked 2 days			
Cut into 5-8cm pieces			
Cooked with 27g sodium carbonate (washing soda) in 3l of water	2h		
Washed in running water in a sieve immersed in a bucket of water	20min		
Beaten with a	5min	Fibres already mushy	Before beating:

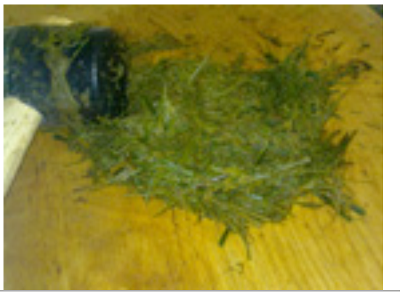
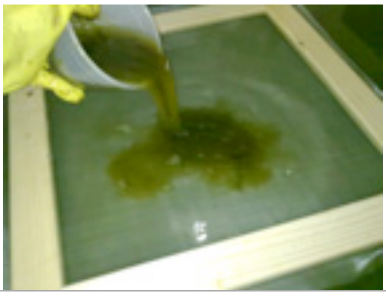
rubber mallet on wooden board		when washing, beaten to pulp very quickly	 After 5 min: 
Put in 2l water with 2 capfuls of hydrogen peroxide 6%	4 days	Colour before soaking 	Colour after soaking 
Formation aid mixed in (okra) Okra extract: 300g frozen okra soaked 2 days to make 1.5l			
Poured into immersed mould, distributed evenly mixing by hand:			
MOULD TEST 6: two aluminium disposable dishes with bottoms cut out and sculpture aluminium mesh inserted between them			
Mould lifted, left to drain first flat, then propped diagonally			

[dry sheets]	 Front of an A4 sheet	 Back of an A4 sheet
	 Back of an A3 sheet	 Back of a round sheet (16cm in diameter)
Sensitizing for photo. exposure	Paper holds together very well.	

Rush grass (collected on 29.2.2012)

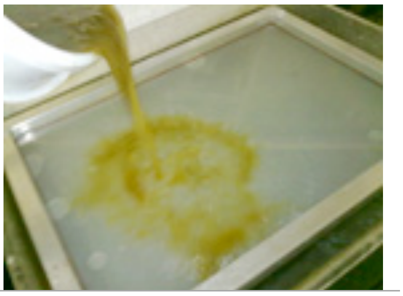
Collected from the wild meadow behind the house;		
Cut into 5-8cm pieces Soaked 24 h		

Cooked with 28g sodium carbonate (washing soda) in 4l of water	1h		
Left to stand in the cooking solution	2h		
Cooked in the same solution	0.5h		
Left to stand in the cooking solution	4h	Total cooking time: **1.5h**	
Washed in running water in the pan	10min		
Beaten with a rubber mallet on wooden board	40min	Fibres very tough and slow to turn into pulp	After 10 min:  After 20 min:  After 30 min:  After 40 min:

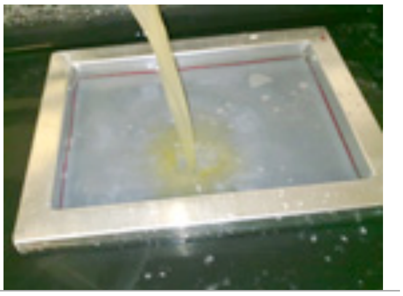
		
Mixed with water		
Poured into immersed mould, distributed evenly mixing by hand		
Mould lifted, left to drain first flat, then propped diagonally		
[dry sheets]	 Front of an A4 sheet	 Back of an A4 sheet

Dry, tall (~1m) grass with very broad leaves (collected on 16.3.2012)

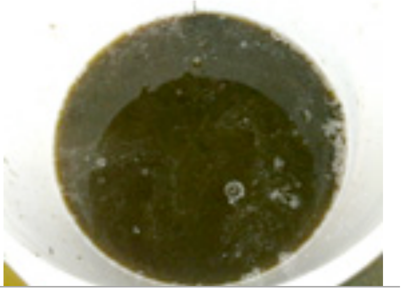
Collected by the path from the house towards the viaduct			
Soaked 20h			
Cut into 5-8cm pieces			
Cooked with 26g sodium carbonate (washing soda) in 3l of water	2h		
Washed in running water in a sieve immersed in a bucket of water	10min		
Beaten with a rubber mallet on wooden board	30min	Plant contains both soft (leaves) and tough (stalk) fragments, which means that part of it changes into pulp quickly, while the other part requires very long beating	Before:  After 10 min:  After 20 min:

		 After 30 min: 
Pulp distributed in water		
Poured into immersed mould, distributed evenly mixing by hand		
Mould lifted, left to drain first flat, then propped diagonally		

[dry sheets]		 Front of an A3 sheet	 Back of an A3 sheet
Pampas grass, dry (collected on 17.3.2012)			
Collected by the path from the house up to Byker			
Soaked 18h			
Cut into 5-8cm pieces			
Cooked with 12g sodium carbonate (washing soda) in 1.5l of water	2h		
Washed in running water in a sieve immersed in a bucket of water	15min		
Beaten with a rubber mallet on wooden board	8 min	Plant contains both soft (seed fluff) and tough (stalk) fragments, which means that part of it changes into pulp quickly, while the other part requires very long beating	Before beating:

		 After: 
Pulp distributed in water		
Poured into immersed mould, distributed evenly mixing by hand		
Mould lifted, left to drain first flat, then propped diagonally	[peatland moss sheet to the left and pampas grass sheet to the right, drying] →	

[dry sheet]		 Front of an A4 sheet	 Back of an A4 sheet
Peatland grass and heather, dry (collected on 18.3.2012)			
Collected in the Moor House National Nature Reserve			
Soaked 2 days			
Cut into 5-8cm pieces			
Cooked with 26g sodium carbonate (washing soda) in 3l of water	2.5h		
Left in the cooking liquid	3h		
Washed in running water in a sieve immersed in a bucket of water	10min		
Beaten with a rubber mallet on wooden board	5min	Part of the fibres turned to a pulp very quickly, while the dry tough fragments of grass and heather remained intact	Before beating: 

		After 5 min: 
Pulp distributed in water		
Poured into immersed mould, distributed evenly mixing by hand		
Mould lifted, left to drain first flat, then propped diagonally	 	

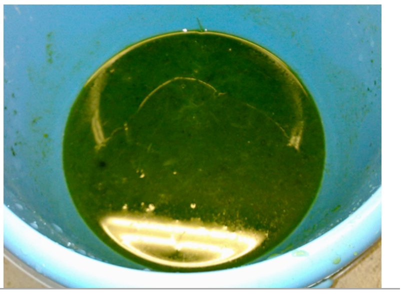
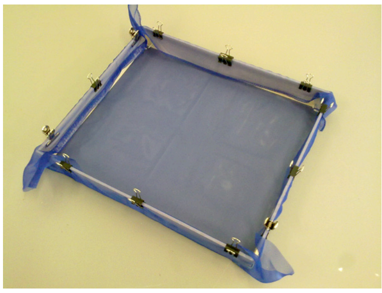
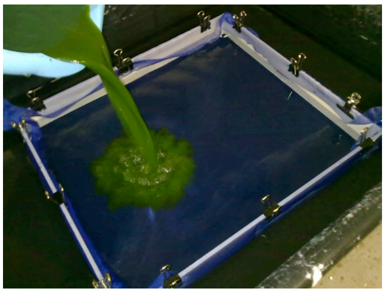
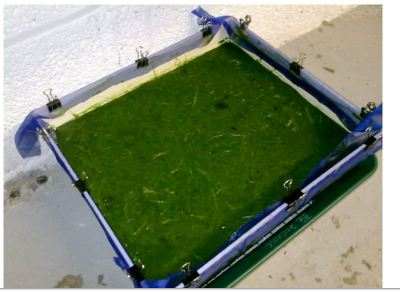
[dry sheets]		 Front of an A3 sheet	 Back of an A3 sheet

Peatland moss, wet (collected on 18.3.2012)

Collected in the Moor House National Nature Reserve			
Soaked 16h			
Cut into 5-8cm pieces			
Cooked with 15g sodium carbonate (washing soda) in 2.5l of water	2h		
Washed in running water in a sieve immersed in a bucket of water	15min		
Beaten with a rubber mallet on wooden board	20min	The material falls apart, does not stick together as pulp should; it is ‘dry’, with short fibres – like the dry leaves tried earlier	Before beating:

	 After 10 min:  After 20 min: 
Pulp distributed in water	
Poured into immersed mould, distributed evenly mixing by hand	
Mould lifted, left to drain first flat, then propped diagonally	

[dry sheets]		 Front of an A4 sheet	 Back of an A4 sheet
Nettles (collected on 28.3.2012)			
Collected by the path to St Peter's			
Soaked	NOT		
Cut into 5-8cm pieces			
Cooked with 21g sodium carbonate (washing soda) in 3.5l of water	2h	TOO LONG? Pulp is mushy	
Left to stand in fresh water	1h		

Washed in running water in a sieve immersed in a bucket of water	15min	Pulp of the mushy type with a lot of fine matter that clogs the sieve (same as pampas grass above etc.)	
Beaten with a rubber mallet on wooden board	2min	More squashing than beating to make sure the harder stalk fragments are broken down	
Pulp distributed in water			
MOULD TEST 7: fine curtain net stretched between wooden enclosure; Pulp poured into immersed mould, distributed evenly			
Mould lifted, left to drain and dry flat; the mesh sags unevenly – better stretch of the mesh needed			

[dry sheets] crumpled on their own accord (no additives in the pulp that might have caused it)		 Front of a 31x38cm sheet	 Back of a 31x38cm sheet

In the tests below I was looking for suitable strong fibred plant, and testing internal sizing to achieve more stable (less absorbent) surface for photographic processes.

Cow parsley (collected on 3.4.2012)

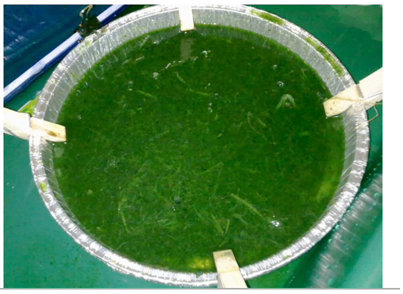
Collected by the path to St Peter's		
Dried		Spread out to dry indoors, left for 3 weeks
Soaked	2 days	
Cooked	20min	With a spoonful of sodium carbonate (washing soda) in 0.7l of water. Already mushy after a short time
Washed	30min	Wrapped up in a mesh and left in a bucket of running water
Beaten	1min	With a rubber mallet on wooden board, already mushy so only tougher parts such as stalks need to be broken
Screened		Pulp put into immersed mould (two round aluminium disposable dishes with bottoms cut out and sculpture aluminium mesh inserted between them, such as in MOULD TEST 6), about 5ml of internal sizing (?) from Gangolf Ulbricht added
Dried		Mould lifted, left to drain and dry flat; took 3 days to dry

[dry sheets]		 Front of a round sheet  Back of a round sheet

Ribwort plantain (collected on 3.4.2012)

Collected by the path to St Peter's		
Dried		Spread out to dry indoors, left for 3 weeks
Soaked	2 days	
Cut		Into 5-8cm pieces
Cooked	25min	With 2-3 spoonfuls of sodium carbonate (washing soda) in 3l of water. Already mushy after a short time
Washed	30min	Wrapped up in a mesh and left in a bucket of running water
Beaten	1min	With a rubber mallet on wooden board, already mushy so only tougher parts such as stalks need to be broken
Screened		Pulp put into immersed mould (the mould used outdoors, as in MOULD TEST 7), about 5ml of internal sizing (?) from Gangolf Ulbricht added
Dried		Mould lifted, left to drain and dry flat; took 3 days to dry
[dry sheets] paper crumpled completely while drying		 Front of a 31x36cm sheet  Back of a 31x36cm sheet

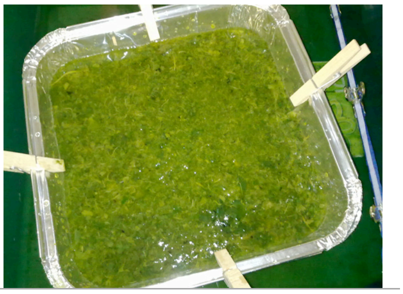
Cleavers (collected on 25.4.2012)

Collected by the path to St Peter's			
Dried	NOT		
Soaked	NOT		
Cut		Into 5-8cm pieces	
Cooked	10min	With 1 spoonful of sodium carbonate (washing soda) in 0.7l of water. Mushy as soon as the water boils.	Before boiling:  After cooking: 
Washed	15min	Wrapped up in a mesh and left in a bucket of running water	
Beaten	1min	With a rubber mallet on wooden board, already mushy so only tougher parts such as stalks need to be broken	
Screened		Pulp put into immersed mould (such as in MOULD TEST 6); no internal sizing added	

Dried		Mould lifted, left to drain and dry flat	
[dry sheets]		 Front of a round sheet	 Back of a round sheet

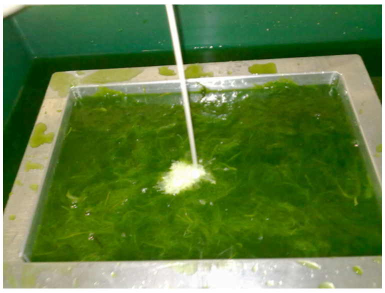
Big-leafed plant (collected on 25.4.2012)

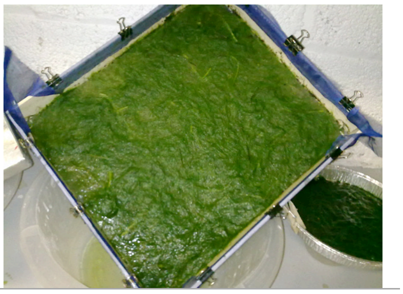
Collected by the path to St Peter's			
Dried	NOT		
Soaked	NOT		
Cut		Into 5-8cm pieces	
Cooked	5min	With 1 spoonful of sodium carbonate (washing soda) in 0.7l of water. Mushy as soon as the water boils.	Before boiling:  After cooking: 
Washed	15min	Wrapped up in a mesh and left in a bucket of running water	

Beaten	1min	With a rubber mallet on wooden board, already mushy so only tougher parts such as stalks need to be broken. The leaf parts of the pulp are crumbling, breaking into small fragments and not sticking together, like dry tree leaves above.	
Screened		Pulp put into immersed mould (such as in MOULD TEST 6); no internal sizing added	
Dried		Mould lifted, left to drain and dry flat	
[dry sheets] paper crumpled completely while drying		 Front of a square sheet	 Back of a square sheet

Broad leafed grass (collected on 25.4.2012)

Collected by the path to St Peter's			
Dried	NOT		
Soaked	NOT		
Cut		Into 5-10cm pieces	
Cooked	1h 15min	With about 3 spoonfuls of sodium carbonate (washing soda) in 3l of water.	

Washed	15min	Wrapped up in a mesh and left in a bucket of running water; squeezed repeatedly to release old liquid absorbed by the fibres	
Beaten	8min	With a rubber mallet on wooden board, pulp felt very tough, probably fibres were not cut in short enough pieces	Before beating:  After 5min:  After 8min: 
Screened		Pulp put into immersed mould (both standard workshop aluminium mould and the mould used outdoors, as in MOULD TEST 7 used), about 5-10ml of internal sizing (?) from Gangolf Ulbricht added	

Dried		Mould lifted, left to drain and dry flat	
[dry sheets] hasn’t curled, even when internal size added (curling occurs in short-fibred sheets?)		 Front of a A4 sheet	 Back of a A4 sheet

Grass fibres prove to be the best – even fresh grass fibre paper is incomparably stronger than those from any other fresh plants, the pulp for which goes mushy almost as soon as the water boils. Moreover, grass sheets dry to a light tone, even though they are very dark in cooking and processing. Other plants dry to a dark colour, which would make any photographic image subsequently exposed onto them less visible. I found that the tone to which a plant naturally dries is a good indication of the tone of paper made from it, whether fresh or dry plant matter is used.

Broad leafed grass (collected on 1.5.2012)

Collected by the path to St Peter’s			
Dried	NOT		
Soaked	NOT		
Cut		Into 5cm pieces	
Cooked	1h 30min	With about 3 spoonfuls of sodium carbonate (washing soda) in 3l of water.	
Washed	15min	Wrapped up in a mesh and squeezed repeatedly in a bucket of fresh running water to release old liquid absorbed by the fibres; water changed often	
Beaten	10min	With a rubber mallet on wooden board, pulp felt very tough (probably	Before beating:

	because they were squeezed dry more than usually) but not as tough as previous batch (this one was cut into shorter pieces before cooking)	 After 5min:  After 10min: 
Screened	Pulp put into immersed mould (standard workshop aluminium moulds, makeshift aluminium dish and mesh moulds - as in MOULD TEST 6 - and the mould used outdoors, as in MOULD TEST 7), about 5-10ml of internal sizing (?) from Gangolf Ulbricht added to some sheets	
Dried	Mould lifted, left to drain and dry flat	

Appendix 7. Talbot’s developing-out direct positive photographic process on plant papers tests (Newcastle, Feb 2012)

All sheets sprayed with rice starch solution and dried beforehand (recipe: 12.5g starch dissolved in a little cold water, added to 450ml of boiling water and boiled for a few minutes).

Dry tussock grass A4 sheet

16.2.2012	Rice starch		Sprayed, and immediately…
	Silver nitrate	10%, fresh, with distilled water	Sprayed
	Dry	Hair dryer	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min (white precipitate formed)
	Water	Cold, 1h	Face down floating
	Dry	Overnight	Flat
	Aceto-nitrate	6.5g sil.nit. + 60ml tap water (=10% sol.) + 10ml acetic acid + 1.3l tap water – old, exhausted?	~50ml sprayed, left for 2 min
	Pre-exposure	1 min	UV unit
	Water	Cold, 1.5h	Face down floating
	Dry	Over weekend	Flat
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	5 min	UV unit, photogram of scissors (not touching in all places)
	Developer	PQ Universal 1+9, 1/3 cold water, 2/3 freshly boiled water, 500ml total	Poured onto the sheet, darkened after 1-2min all over the centre but no image
	Fixer	Darkroom stock, diluted 1:3	2-3min
	Water		

Dry leaves from a park A4 sheet #1

20.2.2012	Rice starch		Sprayed
	Dry		1.5h
[no image – paper disintegrated]	Silver nitrate + starch 1:1	10%, fresh, with distilled water	Sprayed (20ml for 3 A4 sheets)
	Dry		2h
	Potassium	4%, fresh, with	Sprayed, left for 2 min

	iodide	tap water	
	Water	Cold, 1h	Face down floating; sheet started to fall into pieces; not dried
	Aceto-nitrate	6.5g sil.nit. + 60ml tap water (=10% sol.) + 10ml acetic acid + 1.3l tap water – old, exhausted?	2 min bath
	Pre-exposure	missed?	(not sure)
	Water	Cold, 1h	Face down floating
	Dry	Overnight	Flat; not completely dry…
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	5 min	UV unit, photogram
	Developer	PQ Universal 25ml dev + 250ml cold water + 250ml freshly boiled water	Bath?
	Fixer	Darkroom stock, diluted 1:3 ?	2min
	Water	Paper in pieces, no image	

Dry leaves from a park A4 sheet #2

20.2.2012	Rice starch		Sprayed
	Dry		1.5h
	Silver nitrate + starch 1:1	10%, fresh, with distilled water	Sprayed (20ml for 3 A4 sheets)
	Dry		2h
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	Cold, 1h	Face down floating; sheet started to fall into pieces
	Dry	Overnight	Flat
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	50sec	UV unit
	Water	Cold, 30-40min	Face down floating
	Dry	2-3 days	Flat
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min

	Exposure	5 min	UV unit, photogram
	Developer	PQ Universal 25ml dev + 300ml cold water + 400ml freshly boiled water	Bath, image developed within 1min
	Fixer	Darkroom stock, quite diluted	5-10 min
	Water	40min	Image disappeared in fix or wash
	Dry		Flat

Delicate green garden leaves A4 sheet

20.2.2012	Rice starch		Sprayed
	Dry		1.5h
	Silver nitrate + starch 1:1	10%, fresh, with distilled water	Sprayed (20ml for 3 A4 sheets)
	Dry		2h
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	Cold, 1h	Face down floating; sheet started to fall into pieces
	Dry	Overnight	Flat
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	50sec	UV unit
	Water	Cold, 30-40min	Face down floating
	Dry	2-3 days	Flat
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	5 min	UV unit, photogram
	Developer	PQ Universal 25ml dev + 300ml cold water + 400ml freshly boiled water pre-used from previous print with hot water added	Poured onto the sheet, image appeared almost immediately, left for additional 1min
	Fixer	Darkroom stock, diluted 5-10x	5 min
	Water	40min	
	Dry		Flat

Broad-leafed tussock grass (half-dry, half-green) sheet #1

29.2.2012	Silver nitrate 7ml + starch 10ml	10%, fresh, with distilled water	Sprayed
	Dry		2h
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	Cold, 1h	Face up floating
	Drained	(instead of dried)	A few min
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	Missed?	
	Water	Cold, 1h	Face up floating
	Aceto-nitrate (repeated)	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	A few min	In a window, N-side, overcast, 14:30
	Water	Cold, 1h	Face up floating
	Dry	Overnight	Flat
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	5 min	In window, no direct sunlight, semi-overcast, 12:00, photogram
	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water, re-using from other prints + 100ml of hot water added twice over some time, + 100ml of hot water added during dev	Bath
	Water		
	Fixer	Darkroom stock, quite diluted	A few baths with warm water bath in-between
	Water	1h	
	Dry		Flat

Broad-leafed tussock grass (half-dry, half-green) sheet #2

29.2.2012	Sil. nitrate 7ml + starch 10ml	10%, fresh, with distilled water	Sprayed
	Dry		2h
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	Cold, 1h	Face up floating
	Dried	Overnight	Stuck vertically + flat
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	A few min	In a window, N-side, some direct light; darkened
	Water	Cold, 1h	Face up floating
	Dry	NOT DRIED	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	15 min	In window, no direct sunlight, clear sky, 11:30, photogram; printed out (too long)
	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water	Poured onto paper – image turned black immediately
	Water	1min	
	Fixer	Darkroom stock, quite diluted	A few baths with warm water bath in-between
	Water	1h	
	Dry		Flat

Broad-leafed tussock grass (half-dry, half-green) sheet #3

29.2.2012	Silver nitrate 7ml + starch 10ml	10%, fresh, with distilled water	Sprayed
	Dry		2h
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	Cold, 1h	Face up floating
	Dried	Overnight	Stuck vertically + flat
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min

	Pre-exposure	A few min	In a window, N-side, with some light falling directly onto them; darkened
	Water	Cold, 1h	Face up floating
	Dry	30min	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	4 min	In window, no direct sunlight, clear sky, 11:30, photogram
	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water; re-used from previous print + 100ml hot water	Bath?
	Water	1min	
	Fixer	Darkroom stock, quite diluted	A few baths with warm water bath in-between
	Water	1h	
	Dry		Flat

Broad-leafed tussock grass (half-dry, half-green) sheet #4

29.2.2012	Old Dr Diamond’s silver iodide solution	5ml	Sprayed, left for 2min
	Water	?h	immersed
	Dried	Overnight	Stuck vertically
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	A few min	In a window, N-side, with some light falling directly onto them; didn’t darken much
	Water	Cold, 1h	Face up floating
	Dry	1h	Vertically, still damp
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	15 min	In window, no direct sunlight, semi-overcast; 12:00, photogram

Developer	PQ Universal 50ml dev (too much) + 300ml cold water + 400ml freshly boiled water (too much hot water?)	Poured onto paper – paper turned black immediately, no image visible
Water		
Fixer	Darkroom stock, quite diluted, old + some fresh	A few baths with warm water bath in-between
Water	1h	
Dry		Vertically

Broad-leafed tussock grass (half-dry, half-green) sheet #5

29.2.2012	Silver nitrate 5ml	10%, fresh, with distilled water	Sprayed, left for 2min (acc. to Llewellen in Sparling 1856)
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min (white precipitate formed)
	Water	?h	Immersed
	Dried	Overnight	Stuck vertically
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	A few min	In a window, N-side, with some light falling directly onto them; darkened a bit
	Water	Cold, 1h	Face up floating
	Dry	1h	Vertically, still damp
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	15 min	In window, no direct sunlight, semi-overcast; 12:00, photogram
	Developer	PQ Universal 50ml dev (too much) + 300ml cold water + 400ml freshly boiled water (too much hot water?)	Poured onto paper – image turned black immediately with black spots all around
	Water	1min	
	Fixer	Darkroom stock,	A few baths with

		quite diluted	warm water bath in-between
	Water	1h	
	Dry		Flat

Delicate tussock grass (half-dry, half-green) A4 sheet

9.3.2012	Silver nitrate	10%, fresh, with distilled water	Sprayed, left for 20min
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	1h	Paper placed in a tray, water poured onto it through a funnel
	Dried	NOT	
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	4 min	In a window, S-side, overcast
	Water	Cold, 40min	Paper placed in a tray, water poured onto it through a funnel
	Dry	NOT	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	10 min	In N-facing window, overcast; photogram
	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water	Poured onto paper – image appeared straight away, but remained faint; 1.5-2min
	Water		
	Fixer	Darkroom stock (2150XL Ilford), diluted 1:5	2min
	Water		
	Dry		Vertically; image disappeared

Delicate tussock grass (half-dry, half-green) 20x20cm sheet

9.3.2012	Silver nitrate	10%, fresh, with distilled water	Sprayed, left for 20min
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min

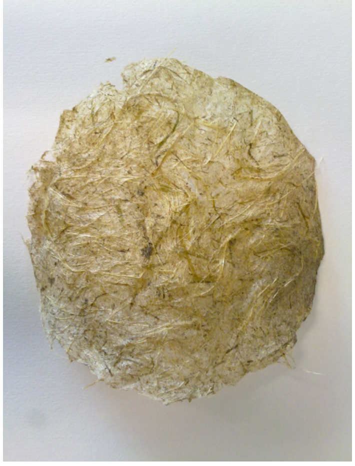
	Water	1h	Paper placed in a tray, water poured onto it through a funnel
	Dried	NOT	
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	5 min	In a window, N-side, overcast
	Water	Cold, 1h	Paper placed in a tray, water poured onto it through a funnel
	Dry	NOT	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	10 min	In N-facing window, overcast; photogram
	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water	Poured onto paper – image appeared straight away, but remained faint (not as faint as the other ones?); 1.5-2min
	Water		
	Fixer	Darkroom stock (2150XL Ilford), diluted 1:5	2min
	Water		
	Dry		Vertically

Iris-like plant round sheet (16cm diameter) #1

9.3.2012	Silver nitrate	10%, fresh, with distilled water	Sprayed, left for 20min
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	30min	Paper placed in a tray, water poured onto it through a funnel
	Dried	NOT	
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	30sec +	In a window, direct sunlight

		1min	No direct sunlight
	Water	Cold, 40min	Paper placed in a tray, water poured onto it through a funnel
	Dry	NOT	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	8 min	In N-facing window, overcast; photogram
	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water	Poured onto paper – image appeared straight away, but remained faint; >5min
	Water		
	Fixer	Darkroom stock (2150XL Ilford), diluted 1:5	2min
	Water		
	Dry		Vertically; image disappeared

Iris-like plant round sheet (16cm diameter) #2

9.3.2012	Silver nitrate	10%, fresh, with distilled water	Sprayed, left for 20min
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	30min	Paper placed in a tray, water poured onto it through a funnel
	Dried	NOT	
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	30sec + 1min	In a window, direct sunlight No direct sunlight
	Water	Cold, 50min	Paper placed in a tray, water poured onto it through a funnel
	Dry	NOT	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	15 min	In N-facing window, overcast; photogram

	Developer	PQ Universal 25ml dev + 250ml cold water + 150ml freshly boiled water	Poured onto paper – whole paper turned black straight away, taken out after 30s
	Water		
	Fixer	Darkroom stock (2150XL Ilford), diluted 1:5	2min
	Water		
	Dry		Vertically; image/darkening disappeared

Iris-like plant round sheet (16cm diameter) #3

9.3.2012	Silver nitrate	10%, fresh, with distilled water	Sprayed, left for a few min
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	40min	Paper placed in a tray of water, face up
	Dried	NOT	
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	30sec + 1min	In a window, direct sunlight No direct sunlight
	Water	Cold, 40min	Paper placed in a tray, water poured onto it through a funnel
	Dry	NOT	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	8 min	In N-facing window, overcast; photogram
	Developer	Separol HE dev: ~4g A powder +~3gB powder + 180ml cold water + 120ml freshly boiled water +a few drops of both liquids	Poured onto paper – image appeared slowly, remained faint; 4min
	Water		
	Fixer	Silverfix	5min
	Water		

	Dry		Vertically

Broad-leafed tussock grass A4 sheet (16cm diameter) #3

9.3.2012	Silver nitrate	10%, fresh, with distilled water	Sprayed, left for a few min
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Water	40min	Paper placed in a tray of water, face up
	Dried	NOT	
	Aceto-nitrate	5ml of 10% sil.nit. + 1ml acetic acid + 100ml tap water – fresh	Sprayed, left for 2 min
	Pre-exposure	30sec + 1min	In a window, direct sunlight No direct sunlight
	Water	Cold, 40min	Paper placed in a tray, water poured onto it through a funnel
	Dry	NOT	
	Potassium iodide	4%, fresh, with tap water	Sprayed, left for 2 min
	Exposure	8 min	In N-facing window, overcast; photogram
	Developer	Separol HE dev: ~4g A powder +~3gB powder + 180ml cold water + 120ml freshly boiled water +a few drops of both liquids	Poured onto paper – image appeared slowly, remained faint; 4min
	Water		
	Fixer	Silverfix	5min
	Water		
	Dry		Vertically

Appendix 8. Direct positive photographic processes on plant papers, working on-site (Andorra, Apr 2012); sizing tests on plant papers (Newcastle, Apr - May 2012)

Dry fern stalks and leaves (+ retted stalks of fennel-like plant) 8.4.2012

Place:		Cortal de la Plana in Vall de la Comella, ~1600m
Plants collected and cut into 5-8cm pieces, stream water added to the pan		
Cooked	1.5h	With a spoonful of sodium carbonate added
Washed in the stream	5 min	Fibres wrapped in a mesh fabric and left in the stream current
Beaten with a stone	5 min	The fern parts are brittle and don't 'stick together' well, but the fennel-like plant responds to beating very well
Screening		In the stream; pulp distributed evenly in a mould with a mesh inserted in water, mould pulled out
Drying	Over-night	Mould left to dry in the sun and overnight (clear sky)
Starch	2.5%	Sprayed, dried in the sun (9.4.2012)
Place:		Rocks in Vall de la Comella, ~1400m; 9.4.2012
Silver nitrate	10%	Sprayed reaching with a hand under the lightproof cover, left for 30-40min
Potassium iodide	4%	Sprayed with pressure sprayer, left for a few min
Water		1.5l, from the stream, sprayed with pressure sprayer, left for 1.5h
Aceto-nitrate		~100ml (containing ~5ml 10% silver nitrate, 15 drops acetic acid) sprayed with pressure sprayer
Pre-exposure	30s	Sunshine, white precipitate uniform on the surface
Water		1.5l, from the stream, sprayed with pressure sprayer, left overnight
Potassium iodide	4%	Sprayed with pressure sprayer, left for 2 min
Exposure	1h	Overcast with a few bright spells
Developer		HE Separol, 300ml, 5g A + 2g B + some starter and toner, mixed into quite hot but not boiled water, poured with a funnel, left for 5min
Water		Warm, with a funnel
Fixer		Warm, first with a funnel, than sprayed, left for some minutes; when uncovered only one black area visible on the paper, no image (too textured? bad focus?)
Water		Cold, 4 or 5 1.5l bottles poured onto uncovered paper
		Left in the rain for 2 days, collected dry

Dry tough mountain grass; 8.4.2012

Place:		Cortal de la Plana in Vall de la Comella, ~1600m
Plants collected in 5-8cm pieces, stream water added to the pan		
Cooked	1h 45 min	With a spoonful of sodium carbonate added
Washed in the stream	5 min	Fibres wrapped in a mesh fabric and left in the stream current
Beaten with a stone	5 min	Not beaten long enough to form a uniform pulp, some unbeaten parts present
Screening		In the stream; pulp distributed evenly in a mould with a mesh inserted in water, mould pulled out
Drying	Over-night	Mould left to dry in the sun and overnight (clear sky)
Starch	2.5%	Sprayed, dried in the sun (9.4.2012)
Place:		Cortal de la Plana in Vall de la Comella, ~1600m; 9.4.2012
Silver nitrate	10%	Sprayed reaching with a hand under the lightproof cover, left for 25min
Potassium iodide	4%	100ml sprayed with pressure sprayer, left for 2 min
Water		From the stream, sprayed with pressure sprayer, first 300ml, left for 15min, then another 300ml, left for 30min
Aceto-nitrate		~100ml (containing ~5ml 10% silver nitrate, 15 drops acetic acid) sprayed with pressure sprayer
Pre-exposure	10s	Sunshine, darkened, except for the white precipitate in the middle of the sheet
Water		From the stream, sprayed with pressure sprayer, first 300ml, left for 15min, then another 300ml, left for 30min
Potassium iodide	4%	100ml sprayed with pressure sprayer, left for 2 min
Exposure	50min	Clear sky, midday
Developer		HE Separol, 300ml, 5g A + 2g B + some starter and toner, mixed into half almost boiled and half cold water (too cold?), poured with a funnel, left for 4min
Water		Cold, 200ml sprayed, left for 5min
Fixer		First cold (30g in 200ml water) sprayed, then warm (100ml) sprayed
Water		Cold, sprayed
		Uncovered (no image) and collected in pieces (mistake – better to leave in tact and collect when dry), washed in running water, dried flat

(Mostly) dry grass; 10.4.2012

Place:		Vall del Madriu, ~1400masl
Plants collected in 5-8cm pieces, stream water added to the pan		
Cooked	1h 10 min	With a spoonful of sodium carbonate added
Washed in the stream	5 min	Fibres wrapped in a mesh fabric and left in the stream current
Beaten with a stone	5 min	Not beaten long enough to form a uniform pulp, some unbeaten parts present
Screening		In the stream; pulp distributed evenly in a mould with a mesh inserted in water, mould pulled out
Drying	Over-night	Mould left to dry inclined on a rock overnight (some rain at first)
Starch	2.5%	Sprayed, dried
Place:		Vall de la Comella, ~1400m; 12.4.2012
Silver nitrate	10%	Sprayed reaching with a hand under the lightproof cover, left for 30min
Potassium iodide	~4%	100-200ml sprayed with pressure sprayer, left for some min
Water		1.5l, from the stream, sprayed with pressure sprayer, left for 1h
Aceto-nitrate		~100ml (containing ~5ml 10% silver nitrate, 15 drops acetic acid) sprayed with pressure sprayer
Pre-exposure	30s	Rather sunny
Water		1.5l, from the stream, sprayed with pressure sprayer, left for 1h
Potassium iodide	~4%	100-200ml sprayed with pressure sprayer
Exposure	1h	Rather sunny, midday
Developer		HE Separol, 500ml, 7.5g A + 3g B + some starter and toner, mixed into water heated to the point of burning fingers, but not boiled (too cold?), poured with a funnel, left for 5min
Water		None
Fixer		200ml, sprayed, left for 3-4h (interruption); then another 200ml of strong solution sprayed
Water		Cold, 1.5l poured onto uncovered paper
		Left in the rain for a few days, collected on 17.4.2012 (frozen)

Dry (retted?) fennel-like plant; 11.4.2012

Place:		Vall del Madriu, ~1800masl
Whole plants (stalks) pulled out of the ground and cut into 5-8cm pieces, stream water added to the pan		
Cooked	1h 10 min	With a spoonful of sodium carbonate added (not long enough)
Washed in the stream	5 min	Fibres wrapped in a mesh fabric and left in the stream current
Beaten with a stone	5-10 min	Not beaten long enough to form a uniform pulp, some unbeaten, hard parts present
Screening		In the stream; pulp distributed evenly in a mould with a mesh inserted in water, mould pulled out
Drying		Mould left to dry inclined on a rock for 20min, then packed and transported wet in a backpack; dried flat
Starch	2.5%	100ml sprayed, dried
Place:		Font del Bosc Negre, ~1400m; 13.4.2012
Silver nitrate	10%	Sprayed reaching with a hand under the lightproof cover, left for 30min
Potassium iodide	~4%	100ml sprayed with pressure sprayer, left for some min
Water		1.5l, from the stream, sprayed with pressure sprayer, left for 30min
Aceto-nitrate		~100ml (containing ~5ml 10% silver nitrate, 15 drops acetic acid) sprayed with pressure sprayer
Pre-exposure	1-2 min	In sunshine, waited until all white precipitate patches darkened
Water		1.5l, from the stream, sprayed with pressure sprayer, left for 30min
Potassium iodide	~4%	100ml sprayed with pressure sprayer
Exposure	30min	Sunshine, midday
Developer		HE Separol, 500ml, 7.5g A + 3g B + some starter and toner, mixed into water that has been boiled and left to cool for a few min, poured with a funnel, left for 5min
Water		Warm, poured with a funnel
Fixer		200ml of strong solution sprayed
Water		Cold, 4 bottles of 1.5l poured onto uncovered paper; darker and lighter part of the image were visible but disappeared when paper uncovered (not enough fixing)
		Left in the rain and snow for a few days, collected on 17.4.2012 (from under snow, frozen)

Evaluation:
Better sizing is needed to make papers that would be more stable (less absorbent, with a more closely-textured, uniformly absorbing surface), like manufactured papers used previously with this method (hole-in-the-ground-cameras and development on-site); I will try waxing the papers or using internal sizing (alkyl ketene dimer sold as 'aquapel'). Dry wax-paper process, as developed around 1850 by Gustave Le Gray is described for example by Greene (2002). It omits Talbot's initial silver nitrate application as practiced here up till now (which results in what is termed double-iodide of silver) and could therefore further simplify my process if successful in producing direct positive images (some successes were seen in tests done in April 2011, see: pages 9-10 Appendix I, but elsewhere it failed, although possibly for other reasons). Omitting first silver nitrate application also allows to apply potassium iodide in daylight rather than with the light blocked.

WAXED PAPER TESTS
First tests for waxing handmade plant papers and using them with the direct positive process:
21.4.2012

Waxing		On the papermaking workshop electric stove: aluminium sheet placed on a stove plate, on top of it some blotters saturated with wax (while waxing paper in the past; not thorough saturation) the plant paper sheet to be waxed, followed by more blotters with wax, and pressed with a heated bottom of a large pan. Greene, 2002, suggests to wax by placing paper between wax-saturated blotters, while dr Keith rubbed wax directly into paper placed on a hot plate – in Jennings and Lundgren, 2002. In either case this has to be followed by heating the waxed paper between clean blotters to remove the superabundant wax.
1. 	**Half of an A4 broad-leafed tussock grass sheet, batch 1 (Appendix 3 page 7)**	
Potassium iodide	2h	4%, with addition of lactose ~8%, to help penetrate the wax; sprayed and left for 2h (till semi-dry)
Dried		NOT
Aceto-nitrate	10min	5ml 10% silver nitrate + 10 drops of acetic acid + 5ml water, freshly mixed (5% sil.nit. solution; this should be on average 8% according to Greene, 2002, and 6.6% according to dr Keith); sprayed
Pre-exposure	1.5min	Paper darkened to brown colour uniformly (over the half that received more wax or perhaps the half that dried during the 2h after applying pot. iodide); overcast
Water	5-10 min	Immersed

Potassium iodide	4%	With addition of lactose ~8%, to help penetrate the wax; sprayed and left for 2min
Exposure	8min	Overcast, in a window, ~3pm; contact print
Developer		HE Separol, 600ml, 7g A + 3g B + some starter and toner, mixed into water that has been boiled and left to cool for 5-10 min, poured onto paper, image appeared immediately, left for 1-2min
Water	2min	Cold, immersed
Fixer	5min	Ilford Hypam Rapid Fixer, very diluted, immersed, cold
Water	30min	Immersed
2. 		**Half of an A4 broad-leafed tussock grass sheet, batch 1 (Appendix 3 page 7)**
Potassium iodide	2h	4%, with addition of lactose ~8%, to help penetrate the wax; immersed in a little liquid in a tray for 2h
Dried		NOT
Aceto-nitrate	10min	5ml 10% silver nitrate + 10 drops of acetic acid + 5ml water, freshly mixed (5% sil.nit. solution; this should be on average 8% according to Greene, 2002, and 6.6% according to dr Keith); sprayed
Pre-exposure	1.5min	Paper has whitish precipitate, hasn't darkened; overcast
Water	5-10 min	Immersed
Potassium iodide	4%	With addition of lactose ~8%, to help penetrate the wax; sprayed and left for 2min
Exposure	8min	Overcast, in a window, ~3pm; contact print
Developer		HE Separol, 600ml, 7g A + 3g B + some starter and toner, mixed into water that has been boiled and left to cool for 5-10 min, poured onto paper, no image appeared, left for 1-2min
Water	2min	Cold, immersed
Fixer	5min	Ilford Hypam Rapid Fixer, very diluted, immersed, cold
Water	30min	Immersed
3.		**An A4 rush grass sheet (Appendix 3 page 16)**

Potassium iodide		4%, with addition of lactose ~8%, to help penetrate the wax; sprayed
Dried	2days	Hanging
Aceto-nitrate	10min	10% silver nitrate + 30 drops of acetic acid (per ~10ml) poured (more than anticipated) onto paper and sloshed around the tray (larger amount of aceto-nit. seems to be crucial for successful pre-exposure)
Pre-exposure	45s	Darkened quickly and quite uniformly; overcast
Water	1h	Immersed face down; water turned milky from the non-exposed silver salts being washed out (a good sign?)
Drained	~2min	Vertically
Potassium iodide	4%	Sprayed and left for 8min
Exposure	10min	Overcast, in a N-facing window, ~12pm; contact print
Developer		HE Separol, 300ml 2,9g A + 1,3g B + some starter and toner, mixed into water that has been boiled and left to cool for a few min (this dev too weak – twice weaker than the lowest recommended concentration), poured onto paper, after a while another 300ml with 5g A + 2g B and some liquids added, image appeared then, left for a few min
Water	1h	Immersed
Fixer	5min	Silverfix, 25g in 600ml (=4%) hot water, immersed bleached the image quite a bit (this was the first paper to be inserted into fresh hot fix)
Water	30min	Immersed
Dried		Stuck to the wall vertically

4. 		**A round ø16cm iris-like plant sheet (Appendix 3 page 13)**
Potassium iodide	2h	4%, with addition of lactose ~8%, to help penetrate the wax; immersed in a little liquid in a tray for 2h
Dried	2days	Hanging
Aceto-nitrate	10min	10% silver nitrate + 30 drops of acetic acid (per ~10ml) sprayed (NO SURE IF SPRAYED ONTO THE SAME SIDE AS POT.IOD.)

Pre-exposure	2min	Paper has very slight white precipitate where aceto-nitrate hasn't reached, elsewhere slight darkening (hardly visible on this paper); overcast
Water	40 min	Immersed face down
Drained	40min	Vertically till half-dry
Potassium iodide	4%	Sprayed and left for 2min
Exposure	10min	Overcast, in a N-facing window, ~12pm; contact print
		Left in the darkroom for 15min
Developer		HE Separol, 300ml 2,9g A + 1,3g B + some starter and toner, mixed into water that has been boiled and left to cool for a few min (this dev too weak – twice weaker than the lowest recommended concentration), poured onto paper, after a while another 300ml with 5g A + 2g B and some liquids added, weak image appeared then, left for a few min
Water	1h	Immersed
Fixer	5min	Silverfix, 25g in 600ml (=4%) hot water, immersed
Water	30min	Immersed
Dried		Hanging

23.4.2012

5. 		**A longer-than-A4 broad-leafed tussock grass sheet, batch 1 (Appendix 3 page 7)**
Waxing		As the 1-4 sheets, but more wax distributed onto the hot aluminium plate to saturate the blotting paper (and subsequently the sheet)
Potassium iodide	1h	4%, with addition of lactose ~8%, to help penetrate the wax; sprayed so that only the top surface was wet
Dried		NOT
Aceto-nitrate	15min	10% silver nitrate + 30 drops of acetic acid (per ~10ml) sprayed
Pre-exposure	3min	Only few small spots browned, the rest with very sparse white precipitate visible hasn't undergone any change; overcast
Water	40 min	Immersed face down
Drained	2min	Vertically
Potassium iodide	4%	(With lactose); sprayed and left for a few min
Exposure	8min	Overcast, in a N-facing window, ~12pm; contact print
		Left in the darkroom for 15min
Developer	20min	HE Separol, 300ml 2,5g A + 1g B + some starter and toner, mixed into water that has been boiled and left to cool for a few min (this dev too weak – twice weaker than the lowest recommended concentration – might have been the reason why no image appeared)

Water	1h	Immersed
Fixer	5min	Silverfix, 25g in 600ml (=4%) warm water, immersed
Water	30min	Immersed
Dried		Hanging
6. 		**An A4 iris-like plant sheet (Appendix 3 page 13)**
Waxing		As the 1-4 sheets, but more wax distributed onto the hot aluminium plate to saturate the blotting paper (and subsequently the sheet)
Potassium iodide	3h	4%, with addition of lactose ~8%, to help penetrate the wax; sprayed so that only the top surface was wet
Dried		Almost dried (damp in some places)
Aceto-nitrate	10min	5ml 8.5% silver nitrate + 8 drops of acetic acid sprayed (with green bottle sprayer)
Pre-exposure	2min	Parts darkened (those that dried more after pot. Iodide?), and in other parts white precipitate remained (it was there already before pre-exposure in natural light!); overcast
Water	40 min	Immersed face down
Drained	2min	Vertically
Potassium iodide	4%	(With lactose); sprayed and left for a few min
Exposure	8min	Overcast, in a N-facing window, ~2pm; contact print
		Left in the darkroom for 15min
Developer	2-3 min	HE Separol, 300ml 5g A + 2g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, image appeared immediately
Water	5min	Immersed
Fixer	5min	Silverfix, 25g in 600ml (=4%) warm water, immersed
Water	30min	Immersed
Dried		Hanging

Conclusions:
It appears that drying thoroughly after potassium iodide is essential for good darkening at pre-exposure and subsequently for the exposure to work (unlike in the previous Talbot's process as practiced with the hole-in-the-ground cameras).
Strong aceto-nitrate (not diluted like in Talbot's procedure) applied generously is needed for the reaction to take place.
Thorough, generous waxing seems to work better than a sparse one.

Gustave Le Gray (in Sparling?) also gave a procedure for non-waxed papers to be exposed wet that omits Talbot's initial silver nitrate application. He suggests applying aceto-nitrate by laying the paper onto a glass pane with some solution spread onto it for 1-5min (waxed papers need longer according to Greene). This suggests that a small amount of solution of appropriate strength is enough, and so spraying (my way of application) should also work.

TESTS OF PAPERS WITH INTERNAL SIZING

7.		**A 20x20cm fragment of an A3 old grass sheet (Appendix 3 page 2)**
Potassium iodide	30min	4%, sprayed
Dried		NOT
Aceto-nitrate		Old diluted 18x, poured onto paper; liquid is whitish, and containing white precipitate? The latter formed immediately on the paper; left for a few min
Pre-exposure	2min	No change; clear sky, N-facing window
Water	1h	Immersed face down
Drained	2min	Vertically
Potassium iodide	4%	Sprayed and left for a few min
Exposure	8min	Clear sky, in a N-facing window, ~2pm; contact print
Developer	2-3 min	HE Separol, 300ml 5g A + 2g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, no image
Water	5min	Immersed
Fixer	5min	Silverfix, 25g in 600ml (=4%) warm water, immersed
Water	30min	Immersed
Dried		Hanging

Very good wet strength.

WAXED AND INTERNALLY SIZED SHEETS TESTED SIDE BY SIDE, DRIED AFTER POT. IOD.

1-2.5.2012

8 – 11.		**Fragments of a broad-leafed grass sheet (Appendix 3 page 35)**
Waxing		On the papermaking workshop electric stove: aluminium sheet placed on a stove plate, some waxed melted on top of it, covered with: blotters saturated with wax, the plant paper sheet to be waxed, followed by more blotters with wax, and pressed with a heated bottom of a large pan. This done on both sides, in sections as the sheet is larger than the aluminium plate and blotters. NOT followed by heating the waxed paper between clean blotters to remove the superabundant wax.
Potassium iodide		4%, with addition of lactose ~8%, to help penetrate the wax; sprayed so that only the top surface was wet
Dried	Over-night	In the studio (in daylight); curled slightly when drying
12 – 15.		**Fragments of an A3 old grass sheet with internal sizing (Appendix 3 page 2)**
Potassium iodide		4%, with addition of lactose ~8%, to help penetrate the wax; sprayed so that only the top surface was wet
Dried	Some days	In the studio (in daylight)

This test done to see if amount of aceto-nitrate and time it is left on the paper before pre-exposure make a difference to the final image. 4 fragments of waxed grass sheet and 4 fragments of internally sized grass sheet processed together in identical conditions except for the two variables.

8. Aceto-nitrate	5min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – small amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; no darkening, some white precipitate
Water	35 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, solution poured onto sheets, image appeared within 1min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

9. Aceto-nitrate	5min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – large amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; darkened
Water	35 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, solution poured onto sheets, image appeared within 1min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

10. Aceto-nitrate	10min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – small amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; white precipitate present on most of the sheet, except some darkening in the middle (where most aceto-nit. must have reached)
Water	30 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	First the pre-used solution as above for a few min, then identical fresh solution made and poured onto sheets: HE Separol, 600ml 10g A + 4g B + some starter and

		toner, mixed into water that has been boiled and left to cool for a couple of min, image appeared within 1min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

11. Aceto-nitrate	10min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – large amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; darkened very fast (seems as if even before taking it into daylight); pre-exposure too long (because it blackened overall in dev.)
Water	30 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	First the pre-used solution as above for a few min, then identical fresh solution made and poured onto sheets: HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, paper quickly began darkening overall, image appeared after a few min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

8.

9.

10.

11.

12. Aceto-nitrate	5min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – small amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; white precipitate, except in the middle where some darkening occurred (where most aceto-nitrate has reached)
Water	35 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, solution poured onto sheets, image appeared within 1min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed

Dried		Hanging

13. Aceto-nitrate	5min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – large amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; darkened, except white precipitate on edges
Water	35 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, solution poured onto sheets, image appeared within 1min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

14. Aceto-nitrate	10min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – small amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; white precipitate
Water	30 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	First the pre-used solution as above for a few min, then identical fresh solution made and poured onto sheets: HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, image appeared within 1min
Water	10min	Immersed
Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

15. Aceto-nitrate	10min	15ml 8.5% silver nitrate + 20 drops of acetic acid sprayed (with green bottle sprayer) – large amount sprayed
Pre-exposure	2min	Overcast, 10am, N-facing window; darkened
Water	30 min	Immersed face up (paper floating)
Drained	1min	Vertically (in tray)
Potassium iodide	4%	(With 8% lactose); sprayed and left for a few min
Exposure	10 min	Overcast, in a N-facing window, ~11am; contact print
Developer	2-3 min	First the pre-used solution as above for a few min, then identical fresh solution made and poured onto sheets: HE Separol, 600ml 10g A + 4g B + some starter and toner, mixed into water that has been boiled and left to cool for a couple of min, paper quickly began darkening overall, image appeared after a few min
Water	10min	Immersed

Fixer	5min	Silverfix, ?g in 700ml warm water, immersed
Water	30min	Immersed
Dried		Hanging

12.

13.

14.

15.

The amount of aceto-nitrate is crucial – there has to be an abundance of silver salts in proportion to potassium iodide for the process to work, which is indicated by darkening during pre-exposure and lack of white precipitate on paper surface.

The optimum amount of time aceto-nitrate is left on the paper before being pre-exposed is not so clear, in case of waxed papers 10mins worked visibly better than 5mins (wax is more difficult for the solutions to penetrate), but in case of internal sizing no clear difference is visible.

Internally sized papers seem to be more tolerant in this test, and the appearance of an image more reliable, although this might be due to lighter tone of the paper used for this test (makes the image more visible, especially when papers are wet).

ALNMOUTH BEACH TESTS

12.05.2012 – beach N of Alnmouth

Waxing A4 sheet of fresh grass		On the papermaking workshop electric stove: aluminium sheet placed on a stove plate, some waxed melted on top of it, covered with: blotters saturated with wax, the plant paper sheet to be waxed, followed by more blotters with wax, and pressed with a heated bottom of a large pan. This done on both sides, in sections as the sheet is larger than the aluminium plate and blotters. NOT followed by heating the waxed paper between clean blotters to remove the superabundant wax.
Potassium iodide		4%, with addition of lactose ~8%, to help penetrate the wax; sprayed so that only the top surface was wet
Dried	Over-night	In the studio (in daylight)
Aceto-nit.	~7min	Sil.nit. 8.5% 15-20ml and ~20 drops of acetic acid, sprayed onto paper placed in black bag, with green hand sprayer
Pre-exposure		Darkened immediately, put straight away into hole and covered
water	40min	~4litres sea water poured and sprayed
Pot iod	A few min	~40ml sprayed with green sprayer
exposure	45min	Semi-sunny, 1pm
dev	2-3 min	Separol: 500ml hot water from a flask, 5gA+2gB + starter+toner, poured with funnel
water		3-4litres of sea water

fix		Sprayed and poured; taken out – sand from sides of the hole collapsed onto the paper, seems like developer hasn't reached the paper properly because of this
Fix - at home		And water in black bag

26.05.2012 – beach S of Alnmouth; A4 sheet of fresh grass

Internal sizing (from Gangolf – Aquapel?)		Added in screening
Potassium iodide		4%, sprayed so that only the top surface was wet
Dried	Over-night	In the studio (in daylight)
Aceto-nit.	A few min	Sil.nit. 8.5% 15ml and ~10 drops of acetic acid, sprayed onto paper placed in the hole, with green hand sprayer
Pre-exposure	½ min	Darkened quickly in direct sunlight
water	30min	Fresh (not sea) water poured and sprayed
Pot iod	2 min	100ml sprayed with pressure sprayer
exposure	30min	Too long? Sunny, ~12pm – no blacks after dev.
dev	3 min	Separol: 300ml hot water from a flask, 7gA+3gB + starter+toner, poured with funnel
water		Hot water
fix	>30 min	Warm, sprayed in 2 barches
water		2litres, and again at home

12.05.2012 – beach N of Alnmouth:

26.05.2012 – beach S of Alnmouth:

Appendix 9. Direct positive photographic processes on plant papers, on-site and tests (Nairs, Switzerland, Jul – Sep 2012)

01 Clemgia, 1400m, 6.7.2012 papermaking (repeated/finished in the Inn since the cooked grass was lost in Clemgia), 8.7.2012 exposure

Broad-leafed grass, a small amount, cooked with quite a lot of sod.carb. on one Power Flame (Coop) gel fuel cartridge (by the Inn version); not sure how long, 1h? and left standing in liquid overnight; easily beaten to good pulp; screened with some difficulty (too much river torrent, not much fibre) in the Inn with Acryperse from Jane; dried in the sun on cloth, no frame

pot. Iod.		Sprayed; 1g in 25ml
dried		Within ~2h
Aceto-nit		7ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~2min	(TOO LITTLE SILVER NITRATE – didn't darken well on pre-exp)
Water	20min	Poured through a funnel, a lot
Pot.iod.		Pressure sprayer, ~75ml
Exp	30min	Sunny spells, some clouds, facing the river upstream, ~1pm
Dev	~3min	Separol, hot (not boiled) water 400-500ml, 7.5gA + 3gB, + starter + toner, poured with funnel
water	~5-10min	Cold, poured with funnel + pressure sprayed
fix	~40min	Twice, cold water, strong, pressure sprayed; uncovered before the second application
water		Poured with funnel
dried		On the sand where exposure has been, collected on 12.7.12

02 Zuort 1700m, 7.7.2012 papermaking, 18.7.2012 exposure

Mixture of mostly tough rush grass and broad-leafed grass, cooked with potful of water and not much sod.carb. on one Power Flame (Coop) gel fuel cartridge under 1h; hard to beat (not cooked long enough, not enough sod.carb), screened with Acryperse (plenty of fibre, thick sheet); left to dry on cloth flat on some wooden boards

pot. Iod.		Sprayed; 1g in 25ml
dried		~ 30min
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, ~11am)
Water	30min	Pressure sprayer, 2l
Pot.iod.		Pressure sprayer, ~75ml
Exp	5min	Sunny, ~12pm, facing Piz Zuort
Dev	>5min	Separol, hot (not boiled) water 500ml, 10gA + 4gB, + toner + starter, poured with funnel
water	~10min	Warm ~200ml, poured with funnel
fix	~30min	Warm, strong, pressure sprayed
water		Pressure sprayed, 5l, after uncovering; darker band across the paper upon uncovering, disappeared in the sun – not fixed sufficiently?

03 Clemgia 1400m, 8.7.2012 papermaking, 12.7.2012 exposure		
Broad-leafed grass, mostly tougher than in 01 (wet-area type rather than normal one), cooked with quite a lot of sod.carb. on one Notkocher gel fuel, just >1h, beaten to decent pulp (tougher grass didn't disintegrate, but less tough did); screened without Acryperse; dried in the sun on cloth, frame removed after 1-2h		
pot. Iod.	4%	Sprayed, ~1g in 25ml
dried		Within 1h, sunny
Aceto-nit		Sil.nit. 8.5% 10ml and ~10 drops of acetic acid
Pre-exp	~30s	Darkened quite well, evenly, mid-dark
Water	20min	~10l poured with funnel straight after pre-exp
Pot.iod.		Pressure-sprayed, ~75ml
Exp	15min	Sunny, facing the river upstream, ~11am
Dev	~5min	Separol, hot (not boiled) water 500ml, 7.5gA + 3gB, + starter + toner, poured with funnel
water	~5-10min	warm, poured with funnel
fix	~40min	warm, med-strength (?), pressure sprayed
water	5min	Transferred into pool of river water
dried		On a stone in the sun, collected same day

04 Inn, Funtana Bonifazius 1200m, 11.7.2012 papermaking, 17.7.2012 exposure		

Various grasses, incl. broad leaves of very tall reed-like grass (cooked down well); cooked using Bozifazius water with quite a lot of sod.carb. on one Power Flame gel fuel, just >1h, beaten briefly to half-decent pulp (tougher grass didn't disintegrate, but less tough did); screened with Acryperse; dried in the sun on cloth, frame removed 5min after screening and paper left on a rock on cloth on site		
pot. Iod.		Sprayed; 1g in 25ml
dried		Within 1h
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed; this repeated due to problems with sprayer the first time round
Pre-exp	~1min	(full sun, ~11am)
Water	30min	Pressure sprayer, 2l
Pot.iod.		Pressure sprayer, ~75ml
Exp	45min	95% cloudy, ~3pm, facing opposite bank of the Inn/upstream
Dev	>5min	Separol, hot (not boiled) water ~400ml, 7.5gA + 3gB, + toner + starter, poured with funnel
water	~10min	Warm ~300ml, poured with funnel
fix	~30min	Warm, strong, pressure sprayed
water		Pressure sprayed, 2l, after uncovering; darker part visible upon uncovering, disappeared later – not fixed sufficiently?

05 Lai da Minschun, 2642m, 19.7.2012 papermaking, 30.7.2012 exposure		
Various grasses, all rather tough mountain variety, incl. the seed-tops of grasses rather than just the leaves; cooked with a lot of sod.carb. on one and a half Notkocher gel fuel, 1.5h, beaten for 5min to half-decent pulp; feels like sod.carb. not rinsed out properly (on all of the papers); screened with Acryperse; dried in the sun on cloth – stretched on frame for 2h, left without frame on cloth flat on rocks for 11 days, found only half of the sheet, quite battered		
pot. Iod.		Sprayed; 1g in 25ml
dried		Within 1h
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed; this repeated due to problems with sprayer the first time round
Pre-exp	~1min	(full sun, ~11am)
Water	30min	Pressure sprayer, 2l

Pot.iod.		Pressure sprayer, ~75ml
Exp	~15min??	95% cloudy, ~3pm, facing opposite bank of the Inn/upstream
Dev	>5min	Separol, hot (not boiled) water ~500ml, 7.5gA + 3gB, + toner + starter, poured with funnel
water	~10min	
fix	~30min	Warm, strong, pressure sprayed
water		Pressure sprayed; paper put into black bag, fixed and washed again at home

06 Tasnan (in Val Tasna), 1850m, 6.8.2012 papermaking (at the Inn by Nairs), 7.8.2012 exposure

Various grasses, softer and harder ones; cooked with a lot of sod.carb. on one Notkocher gel fuel, left to stand for some hours, beaten for a few min to half-decent pulp; screened without Acryperse; dried first at home and than in the sun stretched on frame; sprayed with one layer of transparent spray paint

pot. Iod.		Sprayed; 1g in 25ml
dried		Within ½ h
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, ~3pm)
Water	30min	Pressure sprayer, 2l
Pot.iod.		Pressure sprayer, ~50ml
Exp	10min	Full sun, ~4pm, facing Piz Blaisch Lunga up the valley
Dev	>5min	Separol, hot (not boiled) water ~600ml, 7.5gA + 3gB, + toner + starter, poured with funnel
fix	~30min	Coldish, strong, pressure sprayed
water		Pressure sprayed, only a small amount; wrapped in camera cloth, fixed and washed again at home

TESTS: 8.8.2012 papermaking and exposures (at the Inn by Nairs)

papers made by the Inn at Nairs, from various tougher and delicate grasses, cooked on one Notkocher gel fuel per sheet, (1, 3, 5, 6): left to stand for a few hours after cooking, left to soak in river water for about an hour; (2, 4): left to stand overnight after cooking, left to soak in river water for ~15min; beaten to more (2 – overnight soaking helps) or less decent pulp; screened, dried on the screen

(1)		
	sprayed generously with **two layers of transparent spray paint**	
pot. Iod.		Sprayed; 1g in 25ml (too much)
dried		Within ½ h, in the sun (didn't dry so well on the thick layer of paint)
Aceto-nit		15ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 11am) didn't darken at first, then more sil.nit. sprayed, darkened a little (too much pot. iod.)
Water	30min	Put face up under water that was held in a tray made of black foil underneath the camera (**this left for the whole process**)
Pot.iod.		Sprayed, ~30ml, 4%
Exp	20min	Full sun, ~12pm, facing the opposite side of the Inn (horizon)
Dev	>5min	Separol, hot (boiled water in a flask) ~400ml, 7.5gA + 3gB, + toner + starter, poured with funnel
water		Cold, poured with funnel
fix	~30min	Warm, first pressure sprayed, then the edge of the tray made of black foil underneath clipped up and more fix poured with funnel into and left for some min
water		Allowed to float in the Inn for 5-10min, dried on a stone in full sun

(2)		
	sprayed with 12ml: **Acryperse mixed with potassium iodide (~3%,**	

	dissolved in a little water)	
dried		Within ½ h, in the sun (**rusty red discolouration appeared**)
Aceto-nit		15ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 2pm) didn't darken at first and white precipitate appeared, after ~1min darkened to deep brown, with white bits of precipitate still present on some fibres throughout the sheet
Water	20min	Put face up under water that was held in a tray made of black foil underneath the camera; then water drained and left to sit for another ~15min
Pot.iod.		Sprayed, 50ml, 4%
Exp	28min	Rather cloudy, ~4pm, facing the opposite side of the Inn (horizon)
Dev	>5min	Separol, hot (boiled water in a flask) ~500ml, 7.5gA + 3gB, + toner + starter, poured with funnel
water		Hot, poured with funnel
fix	~30min	Warm, first pressure sprayed, then the edge of the tray made of black foil underneath clipped up and more fix poured with funnel into and left for 10-15 min
water		Allowed to float in the Inn for 5-10min, dried on a stone (cloudy)
(3)		
	sprayed with 13ml: **Acryperse mixed with potassium iodide (~4%, dissolved in a little water)**	
dried		Within ½ h, in the sun (**rusty red discolouration appeared**)
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 11am) within 1min darkened to deep brown, with white bits of precipitate still present on some fibres throughout the sheet (spots of high pot.iod. concentration)
Water	30min	Put face up under water (1.5l) that was held in a tray made of black foil underneath the camera; then water drained and left to sit for

		another 10min; ‘tray’ clipped back
Pot.iod.		Sprayed, 50ml, 4%, left 2min
Exp	30min	Sunny, 12pm, facing the opposite side of the Inn (horizon)
Dev	5min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured with funnel into the ‘tray’ that held it
water		cold, 2l, poured with funnel, ‘tray’ unclipped
fix	15min	Warm, poured with funnel into the ‘tray’ that held it
water		Allowed to float in the Inn for 10min, dried on a stone
(4)		
	Sprayed with **imitation of collodion**, recipe from contrastique.wordpress.com called “Lea’s Landscape #7 Alternate Formula” (no additional ether): 25ml ethanol (Swiss Brennsprit for lighting barbecues) with 1g pot.iod. added (1% solution), tried to dissolve it, didn’t dissolve completely, another 25ml ethanol added, dissolved completely after some time, approx. 50ml of Nitrocellulose-based transparent wood paint added, left to ripen for 1 day (2-3 days stated in the recipe); sprayed in 4 rounds, waiting in-between ~5min to dry, last layer not allowed to dry	
Aceto-nit Pre-exp		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed; didn’t darken (but some white precipitate appeared; ~3pm, sunny); then another 10ml sprayed, darkened after a few min to a subdued brown
Water	30min	Put face up under water (2l) that was held in a tray made of black foil underneath the camera; then water drained and left to sit for another 10min; ‘tray’ clipped back
Pot.iod.		Sprayed, 50ml, 4%, left 2min
Exp	25min	Sunny, 4pm, facing upwards (no mirror): sky and branches
Dev	5min	Separol, hot (boiled water in a flask) ~500ml, 7.5gA + 3gB, + toner + starter, poured with funnel into the ‘tray’ that held it
water		cold, 2l, poured with funnel, ‘tray’ unclipped
fix	15min	Warm, poured with funnel into the ‘tray’ that held it

water		Allowed to float in the Inn for 10min, dried on a stone
(5)		
	Corn starch brushed: 5% - 12.5g dissolved in 100ml cold water, water up to 250ml added and boiled to form thick paste. This brushed onto paper thickly (whole 250ml for one sheet); dried in the sun	
Pot.iod.		Sprayed, 20ml, 4%
dried		Within ½ h, in the sun (some **brown discolouration appeared**)
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 12pm) darkened straight away, liquid stayed on the surface and turned white
Water	30min	Put face up under water (4l) that was held in a tray made of black foil underneath the camera; then water drained and left to sit for another 5min; ‘tray’ clipped back
Pot.iod.		Sprayed, 25ml, 4%, left 2min
Exp	25min	Sunny, 1pm, facing upwards (no mirror): sky and branches
Dev	5min	Separol, hot (boiled water in a flask) ~500ml, 7.5gA + 3gB, + toner + starter, poured with funnel into the ‘tray’ that held it
water		cold, 2l, poured with funnel, ‘tray’ unclipped
fix	20min	Lukewarm, poured with funnel into the ‘tray’ that held it; two times at 0min and 10min; no recognizable pattern of the scene but good patches of shade and light throughout the sheet upon uncovering – this might have been due to varying immersion in residual liquids rather than good exposure and developing
water		Allowed to float in the Inn for 10min, dried on a stone; darkened completely when in water and exposed to light
		PROBLEM: not all liquid appeared to have been flowing out from the ‘tray’ when it was unclipped; modification of the construction needed

(6)		
	(Very delicate grass, cooked to a good pulp with minimal beating necessary, ~1min) **Corn starch brushed: ~5%:** approx 12.5g dissolved in approx 100ml cold water, water up to approx 250ml added and boiled to form thick paste. This brushed onto paper thickly (about 100ml for the sheet); dried inside overnight	
Pot.iod.		Sprayed, 10ml, 4%
dried		Within ½ h, in the sun (some **brown discolouration appeared**)
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 10am) darkened straight away, liquid stayed on the surface and turned white
Water	30min	Put face up under water (2l) that was held in a tray made of black foil stretched on screening frame underneath the camera; then water drained and another 2l poured through the funnel to wash the sheet, foil clipped back up
Pot.iod.		Sprayed, 40ml, 4%, left 2min
Exp	30min	Sunny, 10am, facing upwards (no mirror): sky and branches
Dev	5min	Separol, hot (boiled water in a flask) ~500ml, 5gA + 2gB, + toner + starter, poured with funnel into the 'tray' that held it; unclipped at the end
water	5min	cold, 2l, poured with funnel, held in the 'tray'; then unclipped
fix	40min	Lukewarm, poured with funnel into the 'tray' that held it; no recognizable pattern of the scene but good patches of shade and light throughout the sheet upon uncovering; darker where dev. has been poured in, lighter at the other corner
water		Allowed to float in the Inn for 10min (inside the tray), dried on black foil; darkened completely when drying in direct sunlight – FIX MORE?

(7)		
	(Very delicate grass, cooked to a good pulp with minimal beating necessary, ~3min) **Corn starch brushed: ~5%:** approx 12.5g dissolved in approx 100ml cold water, water up to approx 250ml added and boiled to form thick paste. This brushed onto paper thickly (about 150ml for the sheet); dried inside overnight	
Pot.iod.		Sprayed, 12ml, 0.6g = ~5%
dried		Within ½ h, in the sun (some **brown discolouration** appeared - on the edges only)
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 10am) darkened straight away, liquid stayed on the surface and turned white
Water	30min	Put briefly (20s) face down on river water – white thing on the surface didn't wash away – it's gone into the starch coating? Put up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera; then water drained and another 2l poured through the funnel to wash the sheet, foil clipped back up
Pot.iod.	1min	Sprayed, 25ml, 4%,
Exp	2.5h	Sunny, 10:30am – 1pm, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured with funnel into the 'tray' that held it; unclipped at the end
water	3min	cold, 2l, poured with funnel, held in the 'tray'; then unclipped
fix	40min	Lukewarm, strong, poured with funnel into the 'tray' that held it; two baths: first ~40min, then ~30min; possibly recognizable pattern of the scene, good patches of shade and light (=white) throughout the sheet upon uncovering; darker where dev. has been poured in, lighter at the other corner (where pot.iod. sprayed? –> only partial pot.iod.?)
water	~2h	Water (4l) poured into the tray, still under the camera; dried on black foil; not kept in direct

		sunlight, taken inside to dry
(8)		
	(delicate grass, cooked to a good pulp with minimal beating necessary, ~3min) **Corn starch 5% with pot. iod. 1g brushed:** 12.5g starch and 1g pot.iod. dissolved in 100ml cold water, water up to 250ml added and boiled to form thick paste. This brushed onto paper thickly (about 200ml for the sheet); dried in the sun (**brown discolouration appeared**)	
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 5pm) darkened straight away, some parts where starch+pot.iod. has been thicker turned white, but not as much as in sheets (5)-(7) PUT LESS POT.IOD. NEXT TIME?
Water	30min	Put face up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera; then water drained and 2l poured through the funnel to wash the sheet, foil clipped back up
Pot.iod.	1min	Sprayed, 25ml, 4%
Exp	2.5h	Sunny, 5:30pm – 8pm, facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask) ~500ml, 7.5gA + 3gB, + toner + starter, poured with funnel into the ‘tray’ that held it; unclipped at the end
water	2min	cold, 2l, poured with funnel, held in the ‘tray’; then unclipped
fix	40min	Lukewarm, strong, poured with funnel into the ‘tray’ that held it; no recognizable pattern of the scene but good patches of shade and light (=white) throughout the sheet upon uncovering; darker where dev. has been poured in, the other half lighter (where pot.iod. sprayed? –> only partial pot.iod.?)
water	30min?	Water (4l) poured into the tray, still under the camera; dried on black foil; not kept in direct sunlight, taken inside to dry

(9)		
	Corn starch 1.7% with pot. iod. ~0.2g brushed: 50ml of the 5% solution **(**12.5g starch and 1g pot.iod. dissolved in 100ml cold water, water up to 250ml added and boiled to form thick paste) mixed with some water (~100ml). This brushed onto paper thickly; dried inside (**no discolouration appeared**, also when brought out into sunlight)	
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~1min	(full sun, 12pm) darkened straight away, **without whitening** :ESS POT IOD IS A STEP IN THE RIGHT DIRECTION
Water	40min	Put face up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera (construction changed so that no light leaks onto paper when tray modified from holding liquid to draining; then water drained and 2l poured through the funnel to wash the sheet
Pot.iod.	1min	Sprayed, 25ml, 4%
Exp	2.5h	Sunny, 12:30pm – 3pm, facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask) ~700ml, 7.5gA + 3gB, + toner + starter, poured with funnel into the ‘tray’ that held it; unclipped at the end
water	2min	cold, poured with funnel, 2l allowed to drain, then 2l held in the ‘tray’; drained
fix	~1.5h	Lukewarm, poured with funnel into the ‘tray’ that held it; no recognizable pattern of the scene but good patches of shade and light (=white) throughout the sheet upon uncovering; darker where dev. has been poured in, lighter at the other corner (where pot.iod. sprayed)
water	30min?	Water (4l) poured into the tray, still under the camera; dried on black foil; not kept in direct sunlight, taken inside to dry

(10)		
	Corn starch 5% <u>with pot. iod. 0.2g</u> brushed: 7.5g starch and 0.2g pot.iod. dissolved in ~50ml cold water, water up to ~150ml added and boiled to form thick paste, brushed onto paper thickly; dried in the sun (**no discolouration appeared**)	
Aceto-nit		10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed
Pre-exp	~5min	(clear sky, but no direct sun anymore, ~7pm) darkened slowly, not to such dark brown as in direct sun; **no whitening**
Water	20min	Put face up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera; then water drained and 2l poured through the funnel to wash the sheet
Pot.iod.	1min	Sprayed, 25ml, 4%
Exp	Overnight (~4h sun)	Clear sky, no direct light, 7pm – 10am (overnight), facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask) ~600ml, 8gA + 3.5gB, + toner + starter, poured with funnel into the 'tray' that held it; unclipped at the end
water	2min	cold, poured with funnel, 2l allowed to drain, then 4l held in the 'tray'; drained
fix	40min	Lukewarm, poured with funnel into the 'tray' that held it; no recognizable pattern of the scene but good patches of shade and light throughout the sheet upon uncovering; darker where dev. has been poured in, lighter at the other corner (where pot.iod. sprayed)
water	1h	Water (4l) poured into the tray, still under the camera; dried on black foil; kept in the shade for some time, dried inside

(11)		
	Acidified: 100ml 4.5%vinegar with 200ml water, soaked almost 2h	
	Corn starch 5% with pot. iod. 0.2g brushed: 6.5g starch and 0.2g pot.iod. dissolved in ~50ml cold water, water up to ~130ml added and boiled to form thick paste, ~80ml of it brushed onto paper; dried in the sun (**strong darkening/browning appeared**)	
Aceto-nit		25ml sil.nit. 8.5% and ~20 drops of acetic acid, sprayed inside the camera (through the top hole – first 15ml left for 5min, then 10ml onto other half of the paper, left for additional 3min) – **GREENLAW PROCESS test** (Lundgren, Jennings 2002) **brown discolouration from pot.iod. disappeared, no heavy white precipitate formed**
Pre-exp	~1min	(full sun, 12pm) **hasn't darkened significantly**
Water	30min	Put face up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera; water poured with a funnel and through **a sieve installed underneath the pouring hole (this doesn't work as envisioned, pouring water still makes a hole in the paper)**; then water drained
Pot.iod.	1min	Sprayed, 25ml, and poured, 25ml, 4%
Exp	30min	Sunny, 12:30pm – 1pm, facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured with funnel+sieve into the 'tray' that held it; unclipped at the end
water	5min	cold, 2l, poured with funnel, held in the 'tray'; then unclipped
fix	40min	Warm (1l boiled water, 1l river water), poured with funnel+sieve into the 'tray' that held it; no recognizable pattern of the scene but good patches of shade and light throughout the sheet upon uncovering; darker where dev. has been poured in, lighter at the other corner (where pot.iod. sprayed)
water	1h	Water (4l) poured into the tray, still under the

		camera; dried on black foil; kept in the shade for some time, dried inside
(12)		
	Corn starch 5% with pot. iod. 3.2g brushed: 4g starch (5%) and 3.2g (4%) pot.iod. dissolved in 80ml cold water, boiled to form thick paste, all of it (jut the right amount) brushed onto paper; dried in the sun (**darkening/browning appeared** as the sheet dried)	
Aceto-nit	3min	10ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed inside the camera (not completely covered) - **GREENLAW PROCESS test (**Lundgren, Jennings 2002**) white precipitate formed immediately (TOO MUCH POT.IOD.?)**
Pre-exp	~3min	(clear sky, 7pm) **hasn't darkened significantly, white precipitate partly disappeared**
Water	30min	Put face up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera; water poured into the corner of black foil 'tray'; then water drained
Pot.iod.	1min	Pressure-sprayed, 150ml, 3%
Exp	1h	Clear sky, 7:30pm – 8:30pm, facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask, standing for ~30min) ~600ml, 7gA + 2.3gB, + toner + starter, poured into the corner of black foil 'tray'; drained
water	3min	cold, 4l, poured with funnel, held in the 'tray'; then unclipped; left like this overnight before fixing the next day
fix	3h	Warm (1l boiled water, 1l river water), poured with funnel into the 'tray' that held it; white layer still present
water	1h	Water (4l) poured into the tray, still under the camera; dried on black foil; kept in the shade for some time (white layer turned grey), dried outside (clouds and some sun)

(13)		
	Corn starch 5% with pot. iod. 0.2g brushed: 4g starch (5%) and 0.2g pot.iod. dissolved in 80ml cold water, boiled to form thick paste, brushed onto paper; dried inside **no darkening**	
Aceto-nit	3min	15ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed inside the camera (not completely covered) - **GREENLAW PROCESS test (**Lundgren, Jennings 2002**) some white precipitate formed in creases of the paper immediately (where pot.iod./starch concentrated)**
Pre-exp	~3min	(clouds, sunny spells, 1pm) – away from direct light; **hasn't darkened significantly**
Water	30min	Put face up under water (4l) that was held in a tray made of black foil stretched on screening frame underneath the camera; water poured into the corner of black foil 'tray'; then water drained, foil clipped back up
Pot.iod.	1min	Pressure-sprayed, 120ml, 3%
Exp	13min	Clouds, sunny spells, 1pm, facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask) ~1l, 7.5gA + 3gB, + toner + starter, poured with funnel into the 'tray' that held it; unclipped at the end
water	~5h	cold, 4l, poured into the 'tray' that held it; then unclipped
fix	1h	Hot (1l boiled water with little cold water), poured with funnel into the 'tray' that held it; slight patches of shade and light throughout the sheet upon uncovering
water	overnight	Water (4l) poured into the tray, out of the camera (but it was dark already); dried on black foil outside

(14)		
	Grass + other plants (photos 1 and 2) to darken the colour of the sheet (with the initial intention of using for collodion/ambrotype); cooked maybe 30min, washed in river overnight; formed pulp quickly; not as dark as expected; sheet quite thin and crumbly, crumpling slightly	
	Corn starch 5% with pot. iod. 0.2g brushed: 4g starch (5%) and 0.2g pot.iod. dissolved in 80ml cold water, boiled to form thick paste, brushed onto paper; dried outside in full sun (1pm), darkened	
Aceto-nit	3min	15ml sil.nit. 8.5% and ~10 drops of acetic acid, sprayed inside the camera (completely covered) - **GREENLAW PROCESS test** (Lundgren, Jennings 2002**) some white precipitate formed in parts of the paper (where pot.iod./starch concentrated)**
Water	2min	2l cold water poured straight into the ‘tray’ through the opening in the foil (still approx. light-tight); drained
Pre-exp	~1min	(sunny, 2pm) – mostly in shade, briefly in direct light; **hasn’t darkened significantly**
Water	3h	2l cold water poured straight into the ‘tray’ through the opening in the foil (still approx. light-tight); drained
Pot.iod.	2min	Pressure-sprayed, 120ml, 3%
Exp	30min	Clear sky, 6pm, facing upwards (no mirror): sky and branches
Dev	3min	Separol, hot (boiled water in a flask) ~1l, 7.5gA + 3gB, + toner + starter, poured with funnel into the ‘tray’ that held it; unclipped at the end
water	~5h	cold, 4l, poured into the ‘tray’ that held it; then unclipped
fix	1h	Lukewarm, poured with funnel into the ‘tray’ that held it; uniform tone upon uncovering, white precipitate esp. on the edges – some of the chemical baths didn’t apply well?
water	overnight	Water (4l) poured into the tray, out of the camera (but it was dark already); dried on black foil outside (overnight and the following day – sunny)

GREENLAW'S PROCESS DOESN'T WORK WITH POSITIVES? Either white precipitate forms on sil.nit. application and doesn't disappear, or there is no darkening upon pre-exposure

(15)		
	Grass + other plants (photos 3 and 4 – St John's Wort flowers) to darken the colour of the sheet (with the initial intention of using for collodion/ambrotype); cooked maybe 30min, washed in river overnight; formed pulp quickly; not as dark as expected; sheet quite thin and crumbly, crumpling slightly	
	Corn starch 5% brushed: 5g starch (5%) in 100ml cold water, boiled to form thick paste, brushed onto paper, straight away pressed between foil for 30min, dried in the sun – **darkened to reddish tint!** (why? Traces of pot.iod. present on the foil on which starch was applied?)	
	Transparent spray paint – two layers, dried outside	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, sprayed under the camera (liquid beaded on the painted surface and stayed like this throughout exposure), exposed straight away	
Exp	2h	1:30 – 3:30pm mostly clear sky, some white clouds, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	~1h	Metal tank filled with tap water 3x, sheet face down
Dried	Overnight	Indoors, in front of the radiator, dried almost completely
Amm. chlor		1g in 56ml of tap water (1.8%), sprayed and brushed
Dried	30min	Dried slightly
Sil.nit.		3.5g in 25ml distilled water (14%), brushed
Dried	30min	Dried slightly
Exp	20min	~10am, in the shadow of a tree, photos taken at the beginning and at the end; some parts turned grey/blueish during exposure, no image
Water	30min	Black foil 'tray' filled with water (tap) indoors three times
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

(16)		
	Grass + other plants (photo 5 – babka lancetowata) to darken the colour of the sheet (with the initial intention of using for collodion/ambrotype); formed pulp quickly; not as dark as expected; sheet quite thin and crumbly, crumpling slightly	
	3 sections of sizing (brushed diluted with water, dried in the sun): 1) **Gouache Lascaux white tempera paint** (dried to grey); 2) Coop **Vielzweck-Klebstoff**; 3) **Liquitex gesso** (acrylic, opaque white, matte, fluid; also dried a bit grey)	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, sprayed under the camera, exposed straight away	
Exp	2h	3:30 – 5:30pm mostly clear sky, some white clouds, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	~1h	Metal tank filled with tap water (3 changes), sheet face down
Dried	Overnight	Indoors, flat, in front of the radiator, dried almost completely
Amm. chlor		1g in 56ml of tap water (1.8%), sprayed and brushed
Dried	30min	Dried slightly
Sil.nit.		3.5g in 25ml distilled water (14%), brushed
Dried	30min	Dried slightly
Exp	20min	~10am, in the shadow of a tree, photos taken at the beginning and at the end; some parts turned grey/blueish during exposure, no image
Water	30min	Black foil 'tray' filled with water (tap) indoors three times
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

(17)		
	Grass + other plants (photo 6) to darken the colour of the sheet (with the initial intention of using for collodion/ambrotype); grass bits need much more beating than the rest, other plants fall apart while beating; not as dark as expected; sheet quite thin and crumbly, crumpling slightly	
	Corn starch 5% brushed: 5g starch (5%) in 100ml cold water, boiled to form thick paste, brushed onto paper, dried in the sun and on heater	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors, taken to the camera loosely covered with black foil, exposed moist	
Exp	4h	3 – 8pm some clear sky, some white clouds, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	25min	Black foil 'tray' in the camera filled with water (tap) three times
Dried	Overnight	Indoors, in front of the radiator, dried almost completely
Amm. chlor		1g in 56ml of tap water (1.8%), brushed (same brush as pot.dichr., for all solutions, washed in-between)
Dried	30min	Dried slightly
Sil.nit.		3.5g in 25ml distilled water (14%), brushed
Dried	30min	Dried slightly
Exp	30min	9:35-10:05am, in the shadow of a tree, photos taken at the beginning, after 15min, and at the end; just patches of red (dichromate?) and whitish (which slowly turned grey/blueish during exposure)
Water	30min	Black foil 'tray' filled with water (tap) indoors three times
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

(18)		
	Grass + other plants (photo 7) to darken the colour of the sheet (with the initial intention of using for collodion/ambrotype); after cooking and cooling, some berries (photo 8) and lichens (photo 9) from a tree added and cooked again ~1h (in same water, no more sod.carb. added); berries and lichens mostly taken out before beating, pulp formed quickly (double cooking time)	
	Sprayed with **imitation of COLLODION**, recipe from contrastique.wordpress.com called “Lea’s Landscape #7 Alternate Formula” (no additional ether): 1g pot.iod. dissolved in a little water, (1% solution of total), 50ml ethanol (Swiss Brennsprit for lighting barbecues) added, approx. 50ml of Nitrocellulose-based transparent wood paint added (two jars 200ml and 350ml made); left to ripen for ~ 2 weeks (kept outside under the jetty ~1 week, turned dark red, then kept indoors); 5 coatings, waiting ~1-2min in-between, last one allowed to dry only for ~15s before putting into camera and sensitizing after another ~15s	
Silver nit.	3min	15ml sil.nit. 8% sprayed through both spraying holes of the camera **(light getting in while changing spraying holes?)**
Exp	10s	6,4mm aperture, f/36, sunny, 10am, facing upwards (no mirror): sky and branches **(light getting in while changing spraying holes?)**
Dev	~20-30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; sprayed through both spraying holes **(light getting in while changing spraying holes?)**
Water	2-3min	cold, 2l, poured with funnel through both holes
Fix	15min	Outside of the camera in shade, cold water, in the foil ‘tray’; **white where sensitizer and dev. reached while spraying = overexposed/light leak through spraying holes?**
Water		Allowed to float in the Inn for 10min, dried on a stone

(19)		
	Grass cooked with lichens and bark (photo 10, both from a maple tree?), left to stand for 1 day, dried in the sun	
	Acryperse, undiluted, brushed (only mid of sheet), then pressed in-between foil for 1min (by sitting on the book that weighted it down), dried flat indoors	
	Gelatin sized 3% poured, pressed, hung to drain and later positioned above the radiator to dry, 4x dried in-between	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors, left for 5min, taken to the camera loosely covered with newspaper, exposed moist	
Exp	4h	4pm – 8pm some sun some cloud, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	~15min	Floated on the river when dark outside
Dried	Overnight	Flat, not weighted down or covered with anything
	…Process abandoned because of the red tint still present, and no image visible (like in (22) and (15), (16), (17) that were unsuccessful)	
	USED AGAIN: Brushed with **Gouache Lascaux white tempera paint** and **Liquitex gesso** half-half (see: photo), dried in the sun a few hours	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors **thinly and pooling in creases allowed to drain by holding vertically**, taken to the camera in black bag, exposed moist	
Exp	2h	6 – 8pm clear sky, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	5min	Floated face down on the Inn (dark already); **no image visible, only minimal (or none at all after drying) orange tint**
Dried	Overnight	Indoors, flat; after a few days:
Amm. chlor		1g in 56ml of tap water (1.8%), brushed (same brush as pot.dichr., for all solutions, washed in-between)
Dried	~40min	Dried slightly
Sil.nit.		10g in 100ml distilled water (10%), brushed – **turned orange upon application**
Dried	30min	Dried slightly
Exp	25min	10:35-11am, overcast but quite light, in the

		shadow of a tree, photos taken at the beginning, and every 5min; just patches of red (dichromate?) and whitish (which slowly turned grey/blueish during exposure)
Water	10min	Floated on river, overcast but quite light (12pm), no milkiness leaving the paper observed
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

(20)	Grass cooked in leftover water from (19) (dyed with lichens and bark), red berries added (photo 11), dried in the sun	
	Black paint or ink – sprayed, dried in the sun	
	3rd and 4th quarters **– white Liquitex gesso** brushed	
	QUARTERED (in the photo: clockwise starting in the upper left corner) 1st and 2nd quarters sprayed with **transparent paint,** dried 3rd and 4th quarters painted repeatedly with white gesso (Liquitex) and white tempera paint (Lascaux) **imitation of COLLODION (**same as in (18)) **<u>poured</u> onto the sheet** (on 1st and to a large extent 2nd quarter it drained through the paper immediately – **<u>more sizing necessary)</u>**	
1st quarter		
Silver nit.	~3min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	~10s	6,4mm aperture, f/36, sunny, 11am, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~25ml sprayed through one spraying hole
Water	2-3min	cold, 2l, poured with funnel through one hole
Fix	15min	Outside of the camera in shade, cold water, in the foil 'tray'; **no white, some appeared in the fix – no pattern**

Water		Allowed to float in the Inn for 10min, dried on a stone
2nd quarter		
Silver nit.	~4min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	~10s	6,4mm aperture, f/36, sunny, 11am, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~20ml sprayed through one spraying hole
Water	2-3min	cold, 2l, poured with funnel through one hole
Fix	15min	Outside of the camera in shade, cold water, in the foil ‘tray’; **no white, some appeared in the fix – no pattern**
Water		Allowed to float in the Inn for 10min, dried on a stone
3rd quarter		
Silver nit.	~3.5min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	10s	6,4mm aperture, f/36, cloudy, 4pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~15ml sprayed **through one spraying hole**
Water	2-3min	cold, ~50ml, sprayed **through one spraying hole** (hand-spraying for about 1min; sprayer kept in the hole all the time from sil.nit. to water)
Fix	15min	Outside of the camera in shade, cold water, in the foil ‘tray’; **FAINT PATTERN EMERGED (bit of sky as a dark shape)**
Water		Allowed to float in the Inn for 10min, dried on a stone
4th quarter		
Silver nit.	~3-4min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	15s	6,4mm aperture, f/36, cloudy, 4pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~15ml sprayed **through one spraying hole**
Water	2-3min	cold, ~50ml, sprayed **through one spraying hole** (hand-spraying for about 1min)
Fix	15min	Outside of the camera in shade, cold water, in the foil ‘tray’; **no pattern (exp. too long?)**
Water		Allowed to float in the Inn for 10min, dried on a stone

(21)	Grass cooked with lichens (photo 9), left to stand for 1 day; **pressed** while still moist in-between foil for ~10min (by sitting on the book that weighted it down), dried flat indoors	
	QUARTERED Sprayed with **imitation of COLLODION** (same as in (18)) 1st quarter: ~3 coatings, waiting ~1-2min in-between, other quarters – one more coating each consecutive one, allowed to dry in the sun (all except last coating – this doesn't work??) for each quarter the last coating allowed to dry only for ~15s before putting into camera and sensitizing after another ~15s	
1st quarter		
Silver nit.	~3min	15ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	~10s	6,4mm aperture, f/36, sunny, 11am, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~25ml sprayed through one spraying hole
Water	2-3min	cold, 2l, poured with funnel through one hole
Fix	15min	Outside of the camera in shade, cold water, in the foil 'tray'; **some white, no pattern**
Water		Allowed to float in the Inn for 10min, dried on a stone
2nd quarter		
Silver nit.	~3min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	~5s	6,4mm aperture, f/36, sunny, 12pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~20ml sprayed through one spraying hole, using the same sprayer as for dev. (dev. went cloudy when the end of the sprayer not cleaned after sil.nit. inserted into it)
Water	2-3min	cold, 2l, first sprayed, then poured with funnel

Fix	15min	Outside of the camera in shade, cold water, in the foil ‘tray’; **no white, no pattern – because collodion waited so long before sensitizing = all layers except for the last one allowed to dry?**
Water		Allowed to float in the Inn for 10min, dried on a stone
3rd quarter		
Silver nit.	~3min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	~5s	6,4mm aperture, f/36, sunny, 12pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~20ml sprayed through one spraying hole,
Water	2-3min	cold, 2l, first sprayed, then poured with funnel
Fix	15min	Outside of the camera in shade, cold water, in the foil ‘tray’; **no white, no pattern – because collodion waited so long before sensitizing = all layers except for the last one allowed to dry?**
Water		Allowed to float in the Inn for 10min, dried on a stone
4th quarter (at a later date, just before nr 35)		
Silver nit.	~3.5min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	~10s	6,4mm aperture, f/36, sunny, 2pm, facing upwards (no mirror): sky and branches
Dev	~20s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed through one spraying hole,
Water	1min	cold, 1,5l, poured through a hose into the tray
Fix	5min	Outside of the camera in shade, cold water, in the foil ‘tray’; **uniformly white, no pattern, some collodion lifted (wait longer for it to set)**
Water		Allowed to float in the Inn for 10min, dried on a stone

(22)		
	Grass cooked with lichens (photo 9) – both leftover from (21) (incl. liquid) and fresh; left to stand and then cooked again (on another full Notkocher)	
	Gelatin sized 3% poured, pressed, hung to drain and later positioned above the radiator to dry; 3 coatings dried in-between	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors, left for 5min, taken to the camera loosely covered with newspaper, exposed moist	
Exp	2h	10am – 12pm cloudy, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	20min	Black foil 'tray' in the camera filled with water (tap), four times
Dried	Overnight	Indoors, wrapped in newspaper, hung above the radiator, dried almost completely
Amm. chlor		1g in 56ml of tap water (1.8%), brushed (same brush as pot.dichr., for all solutions, washed in-between)
Dried	30min	Surface-dried hanging above the radiator
Sil.nit.		10g in 100ml distilled water (10%), brushed
Dried	30min	Dried completely – lying on newspapers on the radiator
Exp	45min	10am - 12pm, in the shadow of a tree (some sun some clouds), photos taken at the beginning, after 20min, and at the end; **red colour that appeared immediately upon application of sil.nit. to paper didn't disappear**
Water	30min	Black foil 'tray' filled with water (tap) indoors three times
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

(23)		
	Grass cooked with lichens (photo 9) – both leftover from (21) and (22) (incl. liquid); left to stand and then cooked again (on another full Notkocher)	
	Gelatin sized 3% poured, pressed, dried flat on foil (thick ‘gelatin skin’ formed)	
	Gelatin with pot. iod. 4% brushed: 2 leaves of gelatin in 70ml and 2.8g pot.iod. dissolved in 70ml water; applied 3x and dried outside in the sun in-between **no significant darkening** (possibly a slight one)	
Aceto-nit		15ml sil.nit. 8% and ~15 drops of acetic acid, sprayed in shade, some white precipitate formed straight away
Pre-exp	~3min	In shade, 1pm, clear sky, some darkening underneath the white precipitate
Water	30min	Put briefly (20s) face down on river water – white precipitate on the surface didn’t disappear but some milkiness washed away; Put up under water (~2l) that was held in a tray made of black foil stretched on screening frame underneath the camera
Pot.iod.	1min	Sprayed, 25ml, 4%
Exp	45min	Sunny, 1:00-45pm, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured through a hole in the foil into the ‘tray’ that held it; unclipped at the end
water	2min	cold, 2l, poured with funnel, held in the ‘tray’; then unclipped
fix	40min	Lukewarm, poured through a hole in the foil into the ‘tray’ that held it; **white patches (from pre-exp?), no darkening; darkened upon taking out from camera**
water	~20min	Floated on the Inn face down under black foil, dried outside in light (darkened)

(24)	Grass cooked in an aluminium can on one Notkocher	
	Caparol Capaplex brushed onto it, dried flat in the sun	
	Gelatin brushed thickly onto it, pressed, dried overnight and in the sun	

	QUARTERED imitation of COLLODION (same as in (18)) **poured onto the sheet** 1st and 2nd quarter – waited ~30s before putting into camera and proceeding straight away 3rd and 4th – waited 5min for the collodion to dry in the sun, still moist	
1st quarter		
Silver nit.	~3.5min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	10s	6,4mm aperture, f/36, sunny, 12pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed **through one spraying hole**
Water	1-2min	cold, 1l poured from a bottle through spraying hole (the stream ruined the non-set collodion)
Fix	5min	15%, outside of the camera in shade, cold, in the foil 'tray'
Water		Allowed to float in the Inn for 5min, dried on a stone
2nd quarter		
Silver nit.	~3.5min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	10s	6,4mm aperture, f/36, sunny, 12pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed **through one spraying hole (the same sprayer without cleaning)**
Water	1-2min	cold, a little bit sprayed through the same sprayer in the spraying hole
Fix	5min	15%, outside of the camera in shade, cold, in the foil 'tray'
Water		Allowed to float in the Inn for 5min, dried on a stone

3rd quarter		
Silver nit.	~3.5min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	10s	6,4mm aperture, f/36, sunny, 12pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed **through one spraying hole (the same sprayer without cleaning – but some water sprayed before the dev to clean the sprayer from sil.nit. – it actually clogged the nozzle completely – delay in processing)**
Water	1-2min	cold, poured through the spraying hole (light leaked)
Fix	5min	15%, outside of the camera in shade, cold, in the foil ‘tray’
Water		Allowed to float in the Inn for 5min, dried on a stone

4th quarter		
Silver nit.	~3.5min	10ml sil.nit. 8% sprayed **through one spraying hole** of the camera (using an old sprayer that works erratically; **taken out after spraying and cleaned** with water)
Exp	10s	6,4mm aperture, f/36, sunny, 1pm, facing upwards (no mirror): sky and branches
Dev	~30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed **through one spraying hole**
Water	1-2min	cold, some sprayed, some poured through the spraying hole (some light leaked)
Fix	5min	15%, outside of the camera in shade, cold, in the foil ‘tray’ **no white surface at all**
Water		Allowed to float in the Inn for 5min, dried on a stone

(25)	
	Grass (quite tough, didn’t beat down completely) cooked on one Notkocher
	Middle of sheet sized with gelatin

	Everything cooked again, beaten, screened (didn’t stick very well to form a sheet – fault of the type of grass used rather than insufficient cooking/beating)	
	Sized in parts with (from left to right): corn **starch** 5%, **gelatin** 3%, **gelatin** high% (distilled water) with a little KI	
Pot.iod.		Sprayed, 10ml 4%
Dried		Indoors, above the radiator
Aceto-nit		15ml sil.nit. 10% and 2x pipette acetic acid; sprayed in shade
Pre-exp	~4min	In shade, 2pm, some clear sky, first mostly white precipitate, then mostly good (med-dark) darkening
Water	~5min	Put up under water (~1l) in the tray; then 2l poured from above and run through the tray
Pot.iod.	2min	Sprayed, 25ml (both holes), 4%
Exp	1:10h	Some clear sky, 14:30-15:40, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + **1**gB, + toner + starter, poured from above into the tray
water	2min	cold, 1l, poured from above into the ‘tray’
salt	5min	Cold (with some warm water to dissolve the powder), to stabilize the image before fixing (not necessary if fixing straight away)
fix	10min	Cold (with just a little warm water to dissolve the powder), poured from above into the ‘tray’
water	5min	Floated on the Inn face down under black foil, dried on a stone; **only the part sized with starch had blacks (no recognizable image) and didn’t fall apart (gelatin dissolved in hot processing)**
(26)		
	Grass cooked on one (or two?) Notkocher	
	Gelatin (high concentration) poured onto it (in the middle, edges not sized**),** pressed, dried overnight and in the sun (crumpled a lot)	
	Caparol Capaplex brushed onto it, pressed, dried in the sun (still crumpled after gelatin)	
Pot. dichr.	**WINTHER’S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors, left for 5min, taken to the camera loosely covered with newspaper,	

	exposed moist	
Exp	2h	2:30pm – 4:30pm sunny, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	40min	Black foil ‘tray’ in the camera filled with water, four times, later taken out and kept face up in sunlight for some time – not good? **no image visible**
Dried	Overnight	Indoors, vertically on foil
Amm. chlor		1g in 56ml of tap water (1.8%), brushed (same brush as pot.dichr., for all solutions, washed in-between)
Dried	~40min	Mostly dried
Sil.nit.		10g in 100ml distilled water (10%), brushed - **turned orange upon application**
Dried	30min	Dried completely – lying on newspapers on the radiator
Exp	25min	10:35-11am, overcast but quite light, in the shadow of a tree, photos taken at the beginning, and every 5min; **red colour that appeared immediately upon application of sil.nit. to paper didn’t disappear**
Water	10min	Floated on river, overcast but quite light (12pm); no milkiness leaving the paper observed
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed
(27)		
	Grass cooked on one very full Notkocher, beaten down very quickly	
	Caparol Capaplex brushed onto it, dried flat in the sun (DOESN’T CRUMPLE AS AFTER GELATIN OR STARCH)	
Pot. dichr.	**WINTHER’S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors, left for 5min, taken to the camera loosely covered with newspaper, exposed moist	
Exp	Overnight (~6h of light)	5pm – 11am the next day, sunny one day, overcast the next, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	40min	Black foil ‘tray’ in the camera filled with water,

		four times, briefly kept uncovered outdoors (overcast); **no image**
Dried	Overnight	Indoors, hung over the radiator
	No image – process not continued	
	USED AGAIN:	
	Gelatin with pot. iod. brushed: ~20ml gelatin ~3% (distilled water) with ~2% pot.iod. (~1g); dried inside above the radiator (not completely?)	
Aceto-nit		13ml sil.nit. 10% and NO acetic acid; sprayed in shade
Pre-exp	~5min	In shade, 3pm, overcast, good (rather light) darkening
Water	~10min	Put up under water (~1l) that was held in a tray made of black foil stretched on screening frame underneath the camera; **construction changed:** liquids poured into the tray from the top, tray emptied by lowering one side of it that is normally held level using a stick reaching outside the camera (should be less light leaks than when pouring liquids into the side of the tray)
Pot.iod.	1min	Sprayed, 25ml (in both holes), 4%
Exp	1:00h	overcast, 15:40-16:40, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured from above into the 'tray' that held it
water	2min	cold, 1l, poured from above, allowed to run through
fix	10min	hot, poured from above into the 'tray' that held it
water	~10min	Floated on the Inn face down under black foil, dried outside in light; **no blacks (no image) on the paper – exposure too long or light leaks? Or gelatin washed out during hot processing? (like nr 31?) or fix too hot and strong?**

(28)		
	Grass cooked on one Notkocher	
	Caparol Capaplex brushed onto it, dried flat indoors (DOESN'T	

	CRUMPLE AS AFTER GELATIN OR STARCH)	
	Caparol mixed with white Liquitex gesso (~1:1), brushed, dried flat under the radiator, pressed when half-dry, dried for a few days	
	5% corn starch with a little pot.iod. (quantity not measured, ~1g) – not absorbed but stayed on the surface, used only **~20ml,** dried overnight	
Aceto-nit		15ml sil.nit. 10% and NO acetic acid; sprayed in shade
Pre-exp	~3min	In shade, 1pm, sunny spells, even darkening to light grey (rather than brown)
Water	~10min	Put up under water (~2l) that was held in a tray made of black foil stretched on screening frame underneath the camera; 8min +1min +1min (3 changes of water)
Pot.iod.	1min	Sprayed, 25ml (in both holes), ~4%
Exp	10min	Sunny spells, 1:40-50, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured through a hole in the foil <u>into the 'tray' that held it;</u> unclipped at the end
water	2min	cold, 1l, poured through a hole in the foil
fix	10min	Lukewarm, poured through a hole in the foil <u>into the 'tray' that held it</u>; 2 changes
water	~20min	Floated on the Inn face down under black foil, dried outside in light; **no blacks on the paper (there were also none at pre-exp)– exposure too long or light leaks?**

(29)		
	<u>**Acidified**</u>: 100ml 4.5%vinegar with 200ml water, soaked almost 2h; then washed in river for 1h, pressed straight away after screening, dried flat	
	Sized in parts with (from the top, see photo): corn **starch** 5%, **gelatin** 3%, **Caparol**	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 13g in 100ml tap water**, brushed indoors, dried taped to the wall above the radiator 15min (light-proofed with black cloth), taken to the camera loosely covered with black foil, exposed dry	
Exp	3h	11:45am – 14:45pm overcast, facing upwards

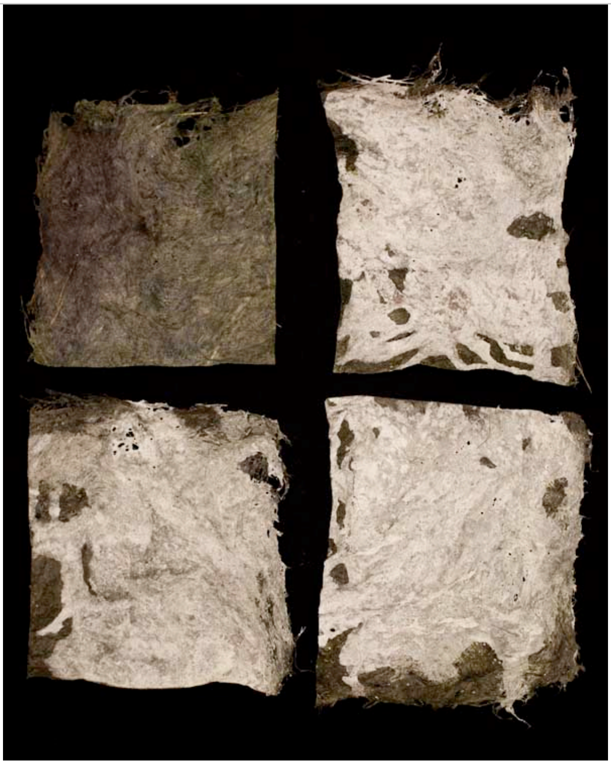
		(no mirror): sky and branches; aperture f/5.3 (43mm)
Water	40min	Black foil ‘tray’ in the camera filled with water, four times (5min, 5min, 20min, 5min) **no image visible**
Dried		Indoors, stuck to the wall above the radiator, on foil
Amm. chlor		1g in 56ml of tap water (1.8%), brushed (same brush as pot.dichr., for all solutions, washed in-between)
Dried	10min	Mostly dried, stuck to the wall above the radiator
Sil.nit.		10g in 100ml distilled water (10%), brushed - **turned orange upon application**
Dried	10min	Mostly dried, stuck to the wall above the radiator
Exp	Evening and morning, overcast	7:45-8pm, overcast and getting dark, under open sky, photos taken at the beginning, at 5min, 15min; then left overnight in the window and exposed again in the morning until 10am in deep shadow (relatively clear sky, photo after 30min) **red colour that appeared immediately upon application of sil.nit. to paper didn’t disappear – but on the part sized with starch mostly no orange discolouration!** (because prepared with boiled water – more acidic / no impurities?)
Water	10min	Floated on river, overcast but quite light (10am); no milkiness leaving the paper observed
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

(30)		
	Acidified: 150ml 4.5%vinegar with 150ml water, soaked overnight; then washed in river for 3h, pressed straight away after screening, dried flat	
	Sized in parts with (from left to right, see photo): corn **starch** 5%, **gelatin** 3%, both prepared with **distilled water,** brush rinsed with boiling water beforehand, first starch than gelatin coated without	

	rinsing brush in-between	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 15g in 150ml distilled water**, brushed indoors (starch sized part absorbed more than gelatin sized one; a darker patch remained where hot starch first pooled), dried taped to the wall above the radiator >15min (light-proofed with black cloth), taken to the camera in black bag, exposed dry (except for a moist patch in the middle)	
Exp	3h	10:10am – 13:20pm overcast + sunny spells, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	40min	Black foil 'tray' in the camera filled with water, four times (5min, 5min, 20min, 5min) incl. some warm water, **no image**
Dried		Indoors, stuck to the wall above the radiator, on foil
Amm. chlor		1g in 56ml of tap water (1.8%), brushed – soaked in a lot of the solution (same brush as pot.dichr., for all solutions, washed in-between)
Dried	10min	stuck to the wall above the radiator, still quite moist
Sil.nit.		15ml (10%), brushed - **turned orange upon application**
Dried	10min	stuck to the wall above the radiator, still rather moist
Exp	Evening and morning	7:10-8:10pm, clear but getting dark, under open sky, photos taken at the beginning, and after an hour; **only slight red discolouration in the middle (where still moist when put into camera), on the part sized with starch blue-grey tone, on the gelatin part no colour clearly visible** (paper very dark); **paper very absorbent and absorption rather uneven – size more?**
Water	10min	Floated on river, overcast but quite light (12pm); no milkiness leaving the paper observed
Curing		Put wet between blotting paper and newspapers, weighted with books; uncovered the next day, no change, not fixed

		
(31)	**Acidified**: 200ml 4.5%vinegar undiluted, soaked 2h; then washed in river for 2h, pressed straight away after screening, dried flat	
	Gelatin with pot. iod. various % brushed: gelatin 2% (distilled water) with (left to right, see photo) 0.5%, 1%, 2% and 4% pot.iod. strips; dried inside overnight	
Aceto-nit		10ml sil.nit. 10% and 3xfull pipette acetic acid; sprayed in shade
Pre-exp	~3min	In shade, 12pm, overcast, good (rather light) darkening where more aceto-nitrate applied no darkening where pot.iod.% the highest=4%? – or was there not enough sil.nit.?)
Water	~10min	Put up under water (~2l) that was held in a tray made of black foil stretched on screening frame underneath the camera
Pot.iod.	1min	Sprayed, 25ml x2 (each hole), 4%
Exp	1:30h	overcast, 11:40-13:10, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured through a hole in the foil into the 'tray' that held it; unclipped at the end
water	2min	cold, 1l, poured through a hole in the foil
fix	10min	Lukewarm, poured through a hole in the foil into the 'tray' that held it; 2 changes
water	~10min	Floated on the Inn face down under black foil, dried outside in light; **no blacks (no image) on the paper – exposure too long or light leaks? Or gelatin washed out during hot processing?**

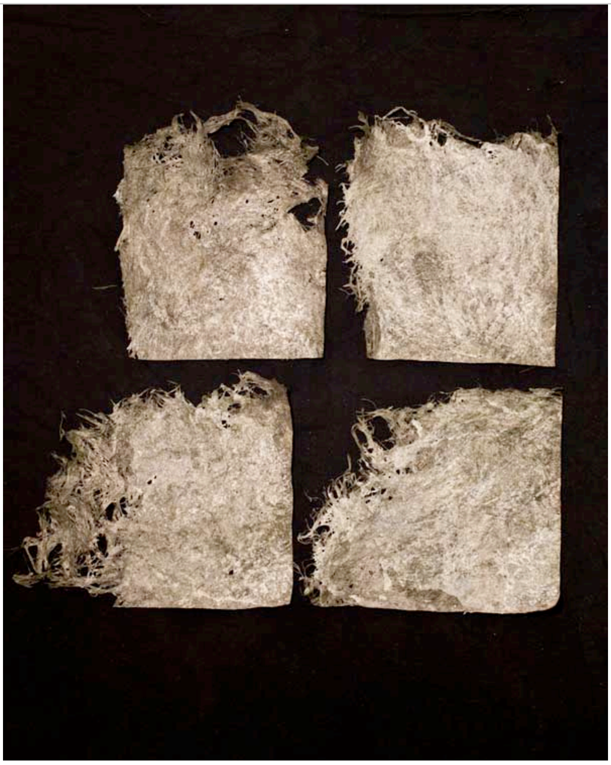
(32)		
	Acidified: 100ml 4.5%vinegar with 100ml river water, soaked ~3h; then washed in river for ~3h, pressed straight away after screening, dried flat	
	Caparol Capaplex brushed onto it, dried above the radiator	
Pot.iod.		Sprayed, 15ml 4%
Dried		Indoors, above the radiator, but also kept outside in faint sunlight – no darkening
Aceto-nit		15ml sil.nit. 10% and full pipette acetic acid; sprayed in shade
Pre-exp	5min	In shade, 6pm, some clear sky, good (med-dark) darkening
Water	~5min	Put up under water (~1l) in the tray; then 1l poured from above and run through the tray
Pot.iod.	1min	Sprayed, 25ml (both holes), 4%
Exp	1:30h	Some clear sky, 18:05-19:40, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 7.5gA + 3gB, + toner + starter, poured through a hole in the foil into the 'tray' that held it; unclipped at the end
water	2min	cold, 1l, poured from above into the 'tray' that held it
fix	30min	warm, poured from above into the 'tray' that held it
water	5min	Floated on the Inn face down under black foil, dried inside; **no blacks (no image) on the paper (only on the edges) – exposure too long or light leaks? Or fix too hot and too strong?**

(33)	**<u>Acidified</u>**: 100ml 4.5%vinegar with 100ml river water, soaked ~1h (no long wash beforehand, almost straight after cooking and rinsing); then washed in river for ~0.5h, pressed straight away after screening, dried on the wall above the radiator and in the sun **Caparol Capaplex** brushed onto it (when paper still moist), dried in the sun (5pm) QUARTERED	
1st quarter		
Pot.iod.		Sprayed, 10ml 4%
Dried		Indoors, above the radiator
Aceto-nit		5ml sil.nit. 10% and NO acetic acid; sprayed in shade
Pre-exp	>5min	Getting dark, 7pm, clear sky, good (med-dark) darkening
Water	~5min	~2l poured from above and run through the tray
Pot.iod.	1min	Sprayed, 15ml (one hole), 4%
Exp	1:30h	clear sky, 19:00-20:30, facing upwards (no mirror): sky and branches
Dev	4min	Separol, warm ~500ml, 5gA + 2gB, + toner + starter, poured from above into the tray
water	2min	cold, 1l, poured from above into the ‘tray’
fix	5min	warm, poured from above into the ‘tray’
water	5min	Floated on the Inn, dried inside; **some blacks, no recognizable image**
2nd to 4th quarter		
	Imitation of COLLODION poured: 2g pot.iod. dissolved in a little distilled water, (1% solution of total), approx. 200ml of Nitrocellulose-based transparent wood paint added; used straight away (didn’t go cloudy – no need to clear?) put into camera, which was made light-tight and sil.nit. sprayed as soon as possible (~1min from collodion to sil.nit)	
Silver nit.	~3.5min	~15ml sil.nit. 10% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	10s (2nd), 5s (3-4rd)	6,4mm aperture, f/36, sunny, 2pm, facing upwards (no mirror): sky and branches
Dev	~20s	118ml distilled water, 5g ferrous sulfate, ~5ml

		acetic acid; ~12ml sprayed **through one spraying hole (different sprayer than sil.nit.)**
Water	1-2min	cold, poured through the hole above – the most light leakage at this point as improvised funnel is transparent; 3rd-4th – tray from black foil present throughout so water kept inside
Fix	5min	15%, outside of the camera in shade, 2nd-warm, 3-4th – cold, in the foil 'tray'; 2nd – uniform white tone throughout; 3rd-4th – some areas went darker in fix – **thinner collodion or shadows of the image there?**
Water		Allowed to float in the Inn for 10min, dried on a stone

(34)	**Acidified**: 100ml 4.5%vinegar with 100ml river water, soaked ~1h (first washed about 2-3h); then washed in river for 2h, pressed when still wet, dried on the wall above the radiator **Caparol mixed with white Liquitex gesso** (~1:1) **and water**, brushed QUARTERED	
1st quarter		
Pot.iod.		Sprayed, 10ml 4%
Dried		Indoors, on the radiator
Aceto-nit		15ml sil.nit. 10% and NO acetic acid; sprayed in shade
Pre-exp	3min	In shade, 9am, sunny, good (med-dark) darkening (to reddish grey rather than brown)
Water	~5min	Put face up under water (~1l) in the tray; then 1l poured from above and run through the tray
Pot.iod.	1min	Sprayed, 15ml (one hole), 4%
Exp	1:10h	sunny, 9:30-10:40, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 5gA + 2gB, + toner + starter, poured from above into the tray
water	2min	cold, 1l, poured from above into the 'tray'

fix	5min	warm, poured from above into the ‘tray’
water	5min	Floated on the Inn face down under black foil, dried on a stone; **some blacks (no recognizable image)** darkened when taken out of the camera (not enough fixing)
2nd quarter		
Pot.iod.		Sprayed, 10ml 4%
Dried		Outdoors, in the sun – no darkening
Aceto-nit		15ml sil.nit. 10% and NO acetic acid; sprayed in shade
Pre-exp	3min	In shade, 11am, sunny, good (med-dark) darkening (to reddish grey rather than brown)
Water	~5min	2l poured from above and run through the tray
Pot.iod.	1min	Sprayed, 15ml (one hole), 4%
Exp	1:10h	sunny, 11:30-12:40, facing upwards (no mirror): sky and branches
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 5gA + 2gB, + toner + starter, poured from above into the tray
water	2min	cold, 1l, poured from above into the ‘tray’
fix	30min	warm, poured from above into the ‘tray’
water	5min	Floated on the Inn face down under black foil, dried on a stone; **some blacks (no recognizable image)** darkened when taken out of the camera (not enough fixing)
3rd and 4thquarter		
	3rd only - blue **ink** painted over the white surface, dried	
	Gelatin ~4%, pressed, dried on the radiator (on newspapers)	
	COLLODION – like in nr 33, fresh, poured and straight into camera	
Silver nit.	~3.5min	~10ml sil.nit. 10% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	3rd - 10s 4th – 30s	6,4mm aperture, f/36, sunny, 11am, facing upwards (no mirror): sky and branches
Dev	3rd – 40s 4th - ~20s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed **through same spraying hole (different sprayer than sil.nit.)**
Water	1-2min	cold, poured through the hole above with light-tight **hose** guiding the water to the tray – no light leaks at this point; tray from black foil present throughout so water kept inside
Fix	5min	15%, outside of the camera in shade, cold, in the foil ‘tray’; **collodion lifted off completely of both sheets – because of gelatin sizing?**
Water		Allowed to float in the Inn for 10min, dried on a stone
(35)	**Acidified**: 100ml 4.5%vinegar with	

	100ml river water, soaked ~3h (no long wash beforehand, almost straight after cooking and rinsing); then washed in river for 5min, pressed straight away after screening, dried on the wall above the radiator overnight **Gelatin** ~3% brushed, dried on the wall above the radiator, trying to make it as flat and even-surfaced as possible, therefore not removed from the foil until completely dry **Caparol –** brushed on when gelatin almost dry, also on foil without un-sticking, dried in the sun	
	QUARTERED	
	COLLODION – like in nr 33, fresh, 20-25ml per sheet, poured, into camera **after: 1st – 1:30min, 2nd – 2min, 3rd – 1:30min (1-3 at ~2pm), 4th – 2:30min (at 5:30pm)** of sitting in the sun	
Silver nit.	~3.5min (4th – 2min)	~10ml (3rd – 15ml) sil.nit. 10% sprayed **through one spraying hole** of the camera (to prevent light leaks); 4th – sprayed slowly over ~1min
Exp	1st and 3rd - 10s, 2nd – 30s, 4th – 5s	6,4mm aperture, f/36, sunny, 2pm (4th – 5:30pm), facing upwards (no mirror): sky and branches
Dev	1-2nd ~20s, 3rd - 4th – 30s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~12ml sprayed **through one spraying hole (different sprayer than sil.nit.)**
Water	1-2min	1.5l, cold, poured through the hole above with light-tight hose guiding the water to the tray – no light leaks at this point; tray from black foil present throughout so water kept inside
Fix	5min (2nd– 20min)	15%, outside of the camera in shade, cold, in the foil 'tray', changed to fresh every 2 sheets; **1st – slight pattern visible but whites are rather gray; 2nd – less pattern than in 1st, whites also grey; 3rd – no pattern, whites are grey; 4th – pattern visible? Some parts cleared completely in fix – indicating that the paper is much**

		more sensitive that assumed in 1st -3rd exposures
Water		Allowed to float in the Inn for 10min, dried on a stone
(36)	**<u>Acidified</u>**: 100ml 4.5%vinegar with 100ml river water, soaked ~3h (long wash beforehand); then washed in river for ~1h, dried on screen **Caparol –** brushed on foil, pressed, dried in the sun **Construction improvements** to make everything more light-tight: water-pouring into hose connection light proofed, light-tight cloth thrown over the whole construction, cardboard close-fit lens deckle QUARTERED	
1st and 2nd quarter		
	COLLODION – like in nr 33, from yesterday (turned red), 20ml per sheet, poured, paper into camera **after: 1st –2min, 2nd – 2:30min** of sitting in the sun	
Silver nit.	2min	~15ml sil.nit. 10% sprayed **through one spraying hole** of the camera (to prevent light leaks)
Exp	5s	6,4mm aperture, f/36, sunny, 12-1pm, facing upwards (no mirror): sky and branches
Dev	~20s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; ~8-10ml, 1st - **sprayed** through one spraying hole (different sprayer than sil.nit.); **2nd – poured through the hose**
Water	1-2min	1.5l, cold, poured through the hole above with light-tight hose guiding the water to the tray – no light leaks at this point; tray from black foil present throughout so water kept inside
Fix	10min	15%, outside of the camera in shade, cold, in the foil 'tray', changed to fresh every 2 sheets; **1st and 2nd – no pattern visible**
Water		Allowed to float in the Inn for 30min, dried on a stone
3rd and 4thquarter		
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:**	

	Potassium dichromate 15g in 150ml <u>distilled</u> water, 5ml sprayed outside in shade, dried indoors: 3rd - on the radiator, light proofed with black cloth; 4th – between newspapers loosely covered with black foil until the next day = NO HEAT; taken to the camera in black bag, exposed dry	
Exp	3rd - 5h 4th – 6h	3rd - 14:50am – 8pm (dark), 4th – 9am - 3pm, both sunny, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	3rd – overnight, 4th – 4h	Black foil 'tray' in the camera filled with water (warm tap water, then cold river water), then 3rd – floated on the river overnight, 4th - floated on a few changes of water in black foil tray inside camera
Dried		Indoors, flat
Am. chlor		1g in 56ml of tap water (1.8%), brushed
Dried	40min	Flat and then propped against the wall, still quite moist
Sil.nit.		~10ml (10%), brushed (same brush as for am. chl, washed)
Dried	30min	hung above the radiator on low setting, still rather moist
Exp	1:40h	9:30 – 11:10am, clear sky, in shade, photos taken at the beginning, and every 5min for first 30min, then every ~20min; **at first highlights went red/brown, then shadows started turning dark/grey?**
Water	5min	Floated on running tap water in the sink
Curing	~20h	Put wet between newspapers, weighted down; uncovered the next day
Fix	~5min	Strong, warm tap water
Water	10min	Floated on the river and briefly in warm tap water
(37)		
	<u>Acidified</u>: 100ml 4.5%vinegar with 100ml river water, soaked ~3h (long wash beforehand); then washed in river overnight, dried on screen	
	Caparol – sprayed, dried indoors (thin sheet – dried quickly)	
Pot. dichr.	**WINTHER'S BICHRO-SILVER PROCESS:** **Potassium dichromate 15g in 150ml distilled water**, 10-15ml <u>sprayed</u> outside when dark, dried indoors overnight - NO HEAT; taken to the camera in black bag, exposed dry	

Exp	8:30h	11:30 – 19:00, sunny, facing upwards (no mirror): sky and branches; aperture f/5.3 (43mm)
Water	overnight	Black foil ‘tray’ in the camera filled with 4 changes of water (hot water mixed with river water), the next day floated on the river (morning sunlight)
Dried		Indoors, flat (a few days)
Am. chlor		1g in 56ml of tap water (1.8%), brushed
Dried	~1h	stuck to the wall above the radiator, completely dry
Sil.nit.		~15-20ml (10%), brushed (same brush, on same piece of foil; some white precipitate formed - where salt concentration has been high??)
Dried	~30min	stuck to the wall above the radiator, light-proofed, completely dry
Exp	~30min-1h too long?	~2pm, overcast, photos taken at the beginning, after 5min and at the end; whole paper turned brown
Water	2h	Floated on river, overcast ~4pm
Curing	~20h	Put wet between newspapers, weighted down; uncovered the next day, no change, not fixed

07 Valmala (Plan d’Agl), 2025m, 14.9.2012 papermaking – collecting and cooking, 17.9.2012 papermaking – screening, drying, and exposure

Broad-leafed grass, a small amount, cooked with quite a lot of sod.carb. on one Notkocher; left standing in the pot for 2 days; easily beaten to good pulp; screened in the river; dried in the sun on cloth,; sprayed with Caparol, dried

Pot. dichr.	**WINTHER’S BICHRO-SILVER PROCESS:** **Potassium dichromate 15g in 150ml <u>distilled</u> water**, sprayed in the camera, paper laid on silica granules, left for 30min – turned out it didn’t dry	
Exp	1h	3:30-4:30, sunny; facing the mountainside – camera tilted severely (forgot mirror) - not light-tight; aperture f/5.3 (43mm)
Water	5min	Floated on running water (warm) in the sink
Dried		Indoors, flat, overnight
Am. chlor		1g in 56ml of tap water (1.8%), brushed
Dried	15min	Flat and then propped against the wall, still quite moist

Sil.nit.		~5ml (~8%), brushed (same brush as for am. chl, washed); turned red upon applicationx
Dried	15min	hung above the radiator on low setting, still rather moist
Exp	~40min	~10am, clear sky, in shade, photos taken at the beginning, and after 10min; and ~5pm, for about 30min, (left in the room in-between – not completely dark) **red discolouration remained as it was upon application**
Water	10min	Floated on running tap water in the sink
Curing	~20h	Put wet between newspapers, weighted down; uncovered the next day
Fix	~5min	Strong, warm tap water

08 Tiral 2587m asl, papermaking – 18.9.2012, exposure – 20.9.2012

Different tough grasses (idea: places so remote that making paper becomes impossible, compare: my failure to obtain a photographic image), cooked with quite a lot of sod.carb. on one Notkocher; beaten to decent pulp; screened in the lake; dried in the sun on the frame, left for a day (rained/snowed in-between); sprayed with Caparol, dried

	COLLODION – NEW: 1) 0.2g KI dissolved in 10ml **70% alcohol** (with 0.1% camphor), to this added 15ml **Kollodium 4%** from the Apotheke, photo of the bottle taken straight away; a glut formed at the bottom (in the clear part – solution not mixed straight away, formed layers – yellow at the top and white below), so after 20min poured into a bottle and shaken to mix 2) 0.2g KI dissolved in a few ml (too much…) distilled water, 10ml **Brennspirit= methylated alcohol** added, to this added 10-15ml **Kollodium 4%** from the Apotheke, shaken to mix, photo of the bottle taken straight away both **poured** onto paper (soaked in a lot, and drained through holes in the surface), waited ~30s before putting into camera and sealing it	
Silver nit.	2min	~25ml sil.nit. 10% **sprayed** through one spraying hole of the camera (to prevent light leaks; some leaks occurred as sprayers had to be taken out for the mirror to be positioned above the lens)
Exp	10s	6,4mm aperture, f/36, sunny, 1pm, facing the lake
Dev	~20s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; 15ml, **sprayed** through the

		second spraying hole (different sprayer than sil.nit.)
Water	1-2min	cold, continuously **sprayed** through same sprayer as dev. (~100ml)
Fix	5min	~15%, outside of the camera, mostly in shade, lake water, in the foil 'tray', agitated continuously
Water	5min	Washed briefly in lake water
(38)		
	<u>**Acidified**</u>: 4.5%vinegar, soaked ~30min (rinsed beforehand); then washed in river ~30min, dried partly on screen partly flat on newspapers	
	Caparol – sprayed, dried indoors	
	2nd half only: gelatin, brushed, dried hanging above the radiator	
	HALVED	
	Construction changes new lens plate from foam board with aperture taped on, and black foil taped on; two holes for sprayers, not to be removed during procedure, on for sil.nit., second for dev. and possibly water afterwards	
	COLLODION – FRESH: 0.2g KI dissolved in 2 ml (too much…) distilled water, 10ml **Brennspirit= methylated alcohol** added, to this added ~15ml **Kollodium 4%** from the Apotheke, shaken to mix **1st half**: ~15ml **sprayed** onto paper, waited ~30s before putting into camera and sealing it; waited a few min while unclogging the sprayer (don't spray collodion!) TOO LONG? **2nd half** - ~15ml **brushed** onto paper, waited ~30s before putting into camera and sealing it;	
Silver nit.	2min	~15ml sil.nit. 10% **sprayed** through one spraying hole of the camera
Exp	10s	6,4mm aperture, f/36, sunny, 1st half - 12pm, 2nd half – 2pm, with mirror, facing Nairs building
Dev	~20s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; 10ml, **sprayed** through the second spraying hole (different sprayer than sil.nit.)
Water	1-2min	cold, continuously **sprayed** through same sprayer as dev. (~50ml) – the 2nd half faced some problems with spraying water, eventually sprayed through sil.nit. sprayer

Fix	5min	~15%, outside of the camera, mostly in shade, tap (1st half) and river (2nd half) water, in the foil ‘tray’, agitated continuously
Water	~40min	Washed in the river
Dried		In the sun
(39)		
	<u>Acidified</u>: 4.5%vinegar, soaked overnight (rinsed beforehand); then washed in river ~30min,	
	Caparol – sprayed, dried in the sun	
	When almost dry, **gelatin**, brushed, dried hanging above the radiator	
	HALVED	
1st half	COLLODION – FRESH: 0.2g KI dissolved in 10ml **70% alcohol** (with 0.1% camphor), to this added 15ml **Kollodium 4%** from the Apotheke, shaken to mix ~15ml **poured** onto paper, waited ~30s before putting into camera and sealing it	
Silver nit.	2min	~15ml sil.nit. 10% **sprayed** through one spraying hole of the camera
Exp	10s	6,4mm aperture, f/36, sunny, 2pm, with mirror, facing Nairs building
Dev	~20s	118ml distilled water, 5g ferrous sulfate, ~5ml acetic acid; 20ml, **sprayed** through the second spraying hole (different sprayer than sil.nit.)
Water	1-2min	cold, continuously **sprayed** through same sprayer as dev. (~50ml), paper uncovered and water poured onto it
Fix	5min	~15%, outside of the camera, mostly in shade, cold river water, in the foil ‘tray’, agitated continuously
Water	~40min	Washed in the river
Dried		In the sun
2nd half:		
Pot.iod.		Sprayed, 10ml 4%
Dried		In the sun
Aceto-nit		10ml sil.nit. 10% and ~10 drops of acetic acid; sprayed
Pre-exp	~5min	Mostly in shade, 12am, sunny, good (med-dark) darkening (paper already dark so not well visible)

Water	~10min	Put face up under water (~1l) in the tray; drained (not very good draining system)
Pot.iod.	1min	Sprayed, 15ml (one hole), 4%
Exp	~1h	sunny, ~12-1pm, facing Nairs building, with mirror
Dev	4min	Separol, hot (boiled water in a flask) ~600ml, 5gA + 2gB, + toner + starter, poured from above into the tray through a hose, connection made light-tight, funnel at the top (not covered)
water	2min	cold, ~1.5l, poured from above into the ‘tray’
fix	15min	warm, poured from above into the ‘tray’
water	5min	Floated on warm water in the sink, dried flat indoors; **some dark and some white areas, good contrast (no recognizable image)**
09 Pass da Costainas 2280m, papermaking - 23.9.2012, exposure – 25.9.2012		
Different tough grasses, cooked with quite a lot of sod.carb. on one Notkocher; beaten to rough pulp; screened in the lake; dried in the sun on the frame, left for two days (rained/snowed in-between); sprayed with Caparol, dried (not entirely, sun disappeared) – very poor cooking/beating, sheet disintegrates		
Pot.iod.		Sprayed, 10ml ~4%
Dried		NOT – sun disappeared, began to rain
Aceto-nit		10ml sil.nit. 10% and ~10 drops of acetic acid; sprayed
Pre-exp	~3min	Overcast, ~12am, some darkening (? – wet paper, hard to tell)
Water	~10min	Put face up under water (~0.5l) in the tray; drained (not very good draining system, not sure if tray holds water)
Pot.iod.	1min	Sprayed, 15ml (one hole), ~4%
Exp	~20min	Overcast, ~12pm, facing N (the lake and beyond)
Dev	4min	Separol, warm (not hot, inefficient heating due to strong wind) ~500ml, 5gA + 2gB, + toner + starter, poured from above into the tray through a hose, connection made light-tight, funnel at the top (not covered)
water	2min	cold, ~0.5l, poured from above (and through the gap between foil – not light-tight) into the ‘tray’
fix	5min	cold, poured from above into the ‘tray’; not rinsed, transported rolled in black foil

water	10min	Warm water poured into black foil tray (only one change), dried flat indoors
	Additional gelatin sprayed on top	

10 God Tamangur/Valbella 2150m, papermaking - 23.9.2012, papermaking cont. – 25.9.2012; (not exposed)

Different tough grasses and fluff from one type of grass, cooked with quite a lot of sod.carb. on one Notkocher, left standing in the liquid for two days; beaten to rough pulp; screened in the stream; dried in the sun on the cloth (also some rain), taken home, dried entirely; sprayed with Caparol, dried; sprayed with gelatin, dried; sprayed with Caparol again, dried

Appendix 10. Dyeing plant paper for use with liquid emulsion direct positive photographic process (Newcastle, Oct 2012); Pellet direct positive process tests (Newcastle, Nov 2012)

Liquid emulsion reversal – in principle, adding 5g ammonium thiocyanate to 300ml working solution developer and developing 3min produces a positive image when on dark background (the same rule as for ambrotype applies).

To produce darker papers I looked into dyeing with natural substances at the stage of making the paper: this included either adding certain dyeing plants to grass cooked for papermaking, or cooking grass in a solution extracted from dyeing plants.

Most dyes need mordanting to make the colour permanent; also, the colour of the grass paper itself can be preserved or changed by adding mordants to normal grass papermaking procedure.

Later I realized that salts of various metals used for mordanting might interfere with the silver content of liquid emulsion – it would therefore be better to make paper that naturally remains dark (such as some papers made at the early stage of the project while experimenting with the suitability of various pants for papermaking – ribwort, etc. were found to produce very dark papers that didn't change colour over time – although these papers were very crumbly); I therefore produced some papers combining grass for fibre strength and other plants for dark colour.

DYEING TESTS

9.10.12 grass (broad-leafed different types), nettles (tops), blackberry leaves and some fruit, elderberries collected

I	Aluminium pot	Grass + soda	1:30h
	Left to stand		5h
	Washed		15min
	Cooked with blackberry leaves juice (these cooked in steel pot 30min)	Ferrous sulphate (Fe) added before adding fibres	5min
	Left to stand		Overnight
II	Aluminium pot	Nettles	40min
		Grass + soda added	50min
	Left to stand		5h
		Fe added	30min
	Left to stand		Overnight
III	Steel pot + copper coins	Grass + soda	1:30h
	Left to stand		4h
	Washed		20min
	Beaten	(Tough grass, good fibres)	5min
	Cooked with elderberry juice (these cooked in steel pot 20min)	Acetic acid (a few ml) and copper sulphate (a little bit) added before adding fibres	? min
	Left to stand		Overnight
IV	Steel pot	Grass + soda	40min-1h
	Left to stand		5h
		Fe added	15min
	Left to stand		Overnight

V	Steel pot	Grass + ivy leaves (cut, about 2:1 proportion) + soda	1:30h
	Left to stand		3h
		Fe added	40min
	Left to stand		?
VI	Steel pot	Grass + soda	1:30h
	Left to stand		3h
	Washed		? min
	Beaten		? min
	Cooked with (pre-used in I) blackberry leaves juice (contains Fe)		35min
VII	Pre-used liquid from II (grass+nettles+Fe)	Grass + some more soda + some more Fe towards the end	1:15h
	Left to stand		?h
VIII	Elderberry pulp pre-used from III boiled (and left to stand) to extract more dye (not containing any chemicals); alum pot	Grass + soda + Fe towards the end	1h
	Left to stand		?h

All washes: on a sieve, standing in a bowl of water, mostly under running tap water

Left to right: V, IV, II, VI, III, I.

Left: VII, right: VIII.

After screening and drying in daylight, all:

- Left for a few days in paper studio to check for light fastness
- Sized with Caparol (sprayed generously, dried)
- Sized with gelatin (various concentration, brushed and pressed with a roller, dried)
- Polished with a wooden tool (for burnishing?)
- Sized with (cooking) gelatin again (brushed), not pressed, dried
- Sized with (150 bloom) gelatin (brushed), not pressed, dried

Exposures on the above:

IV – on Hadrian’s Wall, 20.10.12, old SE1 liquid emulsion brushed at home in the cupboard at night using red bike lamp (fogged the emulsion?), loaded into black changing bag camera, exposed vertically, developed after 2 days (old Moersch developer with some ammonium thiocyanate) 3min -> uniformly light creamy surface = overexposed/fogged, water, fix, water

II (not pressed sheet)– in the darkroom, some leftover old SE1 liquid emulsion (diluted with water, possibly fogged??) poured onto the paper (not enough emulsion/ too watery, no good coating), dried ~10min, exposed in box camera ~30s, developed in Separol 300ml with 5g ammonium thiocyanate 3min, fixed; no coating visible
(the same sheet sensitized and exposed again) – Foma liquid emulsion (a few spoonfuls) dissolved, one drop of hardener (supplied with emulsion) added, brushed onto paper (in changing bag camera), waited 30min (zipped unfolded bag), exp. 15s 15:00 overcast, dev. Separol starter +5gA +2gB +toner +5g amm.thiocyanate 3min, fix 3 baths ~1:4 darkroom supply, water 5-10min

V - Foma liquid emulsion (a few spoonfuls) dissolved, two drops of hardener (supplied with emulsion) added, brushed onto paper (in changing bag camera), waited 30min (zipped unfolded bag), exp. 40s 11:30 overcast, dev. darkroom supply: Fotospeed PD5 1+9 300ml +5g amm.thiocyanate 3min (image visible, shadows clear), fix darkroom supply Fotospeed 1 bath 1:9 300ml (shadows not clear anymore, no image except extreme highlight visible; not sure if not already dissolved for use in the bottles?), water 1:30h floated face-down, hung to dry

II (the other sheet, pressed at one sizing stage) - Foma liquid emulsion (a few spoonfuls) dissolved, one drop of hardener (supplied with emulsion) added, brushed onto paper (in changing bag camera), waited 6min (zipped unfolded bag), exp. 45s 16:00 clear sky, dev. darkroom supply: Fotospeed PD5 undiluted 300ml +5g amm.thiocyanate 3min, fix 1 bath ~1:2 darkroom supply, water 5min

ON LOCATION - Cheviot Hills

Paper made on Scald Hill (E of the Cheviot), 13.10.12

- Grass cooked with heather (tops) with quite a lot of soda for 1h
- Ferrous sulphate added towards the end, left standing for 30min
- Heather removed
- Washed briefly in a very small pool of water (not enough water to neutralize alkalinity)
- Beaten a few min into good pulp
- Screened
- Pressed in a clip frame, taken home and dried flat
- Sized with Aquapel (hasn't dried flat afterwards, plus whitish areas remained)

Exposure 20.10.12 on Hadrian's Wall, N of Haltwhistle, near disused quarry filled with water, under the rock face (lens pointing up, rock face outline visible)

- Paper inserted into a (hopefully light tight) camera
- Liquid emulsion sprayed (poor spraying, had to take it out many times, sprayed in a jet rather than mist, only patch under the hole sprayed), waited a few min
- Exposure 15s, overcast, ~1pm
- Dev. (old Moersch) with ammonium thiocyanate sprayed, 3min
- Fix sprayed through same sprayer, ~3min
- Taken out, packed in black foil bag
- Fixed again and washed in the darkroom

LIQUID EMULSION TESTS
8.10.12

Old SE1 emulsion

1 – 3. emulsion 2:1 with 70% alcohol, sprayed (alcohol seems unnecessary, too liquid and doesn't dry fast), dried hanging (some fogging through opening the door?), exp. 30s, sunny, 1pm, from the bridge between Squires and Lipman buildings, dev. Moersch, old, 1+9, +5g amm.thioc., darkened immediately, 3min (nr 2. – darkest sheet, emulsion didn't sink but pooled on the surface – image visible during processing, not so much when dry)

4. same but exp. 20s

photos – left: nr2, right: nr3.

5. emulsion poured on, waited 5min, exp. 20s overcast, dev as above – sprayed 3min, water and fixer sprayed – Fotospeed Rapid Fix – imaged fogged in fix?

6. emulsion sprayed, waited 20min, exp. 30s., dev. 3,5min, rest as above; highlights in the sky appear darkest (no reversal?)

photos – left: nr5, right: nr6.

7 – 9. Paper uneven – this causes pooling of sprayed emulsion; waited: 7: 10min, 8: 30min, 9: 50min; exp. 7: 10s, 8: 30s, 9: 50s; dev. Moersch fresh as above 6min sprayed, water 30s sprayed, fix Silverfix sprayed

photo – left to right: nr 7 to 9.

12.10.12

10 (paper 1. re-used), 11 (paper 4. re-used), 12 – emulsion diluted ~4:1 with alcohol 70%, sprayed, waited 10: 10min, 11: 20min, 12: 30min; exp: ??? (~10s?), dev. (from day before, Moersch) ~50ml/sheet sprayed, water sprayed 30s, fix Fotospeed Rapid Fix ~1:6 sprayed 3-5min, water 1h immersed; 10 – emulsion slid off (not dry enough before dev)

photo – left to right: nr 10 to 12.

30.10.12

Foma emulsion 2 coats, dried hanging under the air-con, 15-20 min
10-11am, mostly sunny, sun reflected in photographed windows, see: photo of the view

1. exp 10s	PQ Universal, old, 1+9, +5g amm.thioc. print darkened immediately, 1min
2. exp 10s	Separol 1+9, fresh, +5g amm.thioc., very slow action, some image showed, 6min

3. exp 2s	Same as above, 5:30min
4. exp 30s	Same as above, 5min
5. exp 10s	Separol 1+4, fresh, +5g amm.thioc., slightly quicker action, 3min THIS ONE THE BEST OF THE BATCH

All fixed in Silverfix, 2 baths
NONE HAS REVERSED

Above, left to right: 1 to 5. A slight image visible in nr 3 and (more) in nr 5 – enlargement below, compared with the view that was in front of the camera, showing that the image didn't reverse into positive (sky rendered black).

PELLET PRINTS

6.11.12
Solution according to Terry King and recipe nr 2 (page 500, *The Blue Print*, 1900):
Distilled water 100ml, PVA glue 10g, ferric chloride 10g, oxalic acid 5g (mixed in-between in plastic dish, poured into brown glass bottle, washed with distilled water, previously used for silver solution)

1.

- sized with gelatin 150 bloom with formalin, dried hanging (almost dry)
- coated with a brush in artificial light – darkroom, one bulb (brush contaminated the solution?), dried hanging in darkroom (mostly red light on rather than white one)
- pinned inside the black bag camera with magnifying glass lens (no aperture),
- in papermaking studio, facing the roundabout
- 6. 11.12 12pm to 7.11.12 8:30am (about **4 + 2 hours** of daylight, cloudy?)
- water, immersed, ~5min
- 20ml ~20% solution of pot. ferrocyan. (made with distilled water) sprayed, left 1,5min
- water a few min
- sulphuric acid (One Shot drain cleaner, 91%?), a few ml in ~500ml water ~5min
- running water ~10min
- hung to dry
- no image, uniformly blue

2.

- paper made 30.10.12 – no mordants used in case they react with silver in liquid emulsion; grass + ribwort (~1:1) + dandelion leaves (dark, added towards the end of cooking); Cooked 1:15h, left to stand 1:15h, washed 10min running water, acidified (~4% acetic acid) 10min, beaten a few min, 3 sheets screened, dried on mesh; very brittle
- sized with gelatin + formalin, one sheet came apart, dried flat
- sensitized with cotton swab (very slight chance of gloves being contaminated with developing solution) by repeatedly pressing the wet cotton onto paper
- straight into box camera, zipped and set up for exposure when it was already dark outside (camera and view same as above) – a mistake – not allowed to dry before exp?
- **2 days:** 7.11.12 4:30pm to 9.11.12 5:30pm (8.11.12 – sunny, 9.11.12 cloudy), stored in a locker to be developed in a few days
- water, immersed, ~5min
- 20ml ~20% solution of pot. ferrocyan. (made with distilled water) sprayed, left 2,5min
- water, three changes
- sulphuric acid (One Shot drain cleaner, 91%?), a few

ml in ~500ml water ~1h
- running water ~2min
- left to dry in tray, vertically
- no image, uniformly blue

3.

- old paper, gelatin + formalin sized, acidified ~15min (a few ml acetic acid in ~800ml water)
- sensitized with cotton swab
- hung to dry a few hours, hopefully darkroom remained dark throughout
- pinned inside the camera as above
- 9.11.12 5:30pm to 19.11.12 5:30pm (**10 days)**
- water, running, ~1min
- 20ml ~20% solution of pot. ferrocyan. (made with distilled water) sprayed, left 1,5min
- water, running, 2min
- sulphuric acid (One Shot drain cleaner, 91%?, paper brushed while in the bath to remove pigment from highlights – no effect?), a few ml in ~500ml water ~5-8min
- running water ~5min
- dry hanging
- no image, uniformly blue although one half seems less dense than the other

Appendix 11. Tests for exposing photographs using light-sensitivity of pigments naturally present in plant paper (Newcastle, Nov 2012 – Mar 2013)

IN-CAMERA 1 **4x magnification lens 58mm diameter**

- Fresh grass sheet made the day before, dried inside papermaking room (no sunlight), acidified
- Box camera with 4x magnification lens 58mm diameter, no aperture
- In papermaking studio, facing the roundabout
- 31.10.12 – 28.2.13 **118 days**

after **21 days**, on 21.11.12 (photo below) – no image

after **40 days**, on 10.12.12 (photo below) – the faintest differentiation between lighter area exposed to the sky (top of the sheet in the photo) begins to be visible

after **67 days**, on 7.1.13 (photo below) – difference between dark and light area clearly visible

after **118 days**, on 28.2.13 (photo below)

LIGHT SENSITIVITY TESTS – CONTACT PRINTING:

1. paper from delicate grass collected behind Coach Lane library 9.11.12

- started cooking with washing soda, pots boiling ~20min and 1min respectively, left to stand over the weekend
- cooked again ~1h
- washed 5min, running water until water is clear
- acidified (a slosh of acetic acid in ~1l water), left 1.5 days
- beaten shortly (doesn't stick very well – too long in acid?)
- screened
- left to dry in the papermaking room without natural light 2 days
- masked with mounting board, backed with mounting board: 16.11.12 morning – 7.1.13 **52 days**

after 6 days - 21.11. – photo below - some change visible but not very clear – not much pigment in this type of grass – too old/dry or papermaking over too long a period – paper bleached?

after 8 days - 23.11. – photo below – slightly more visible

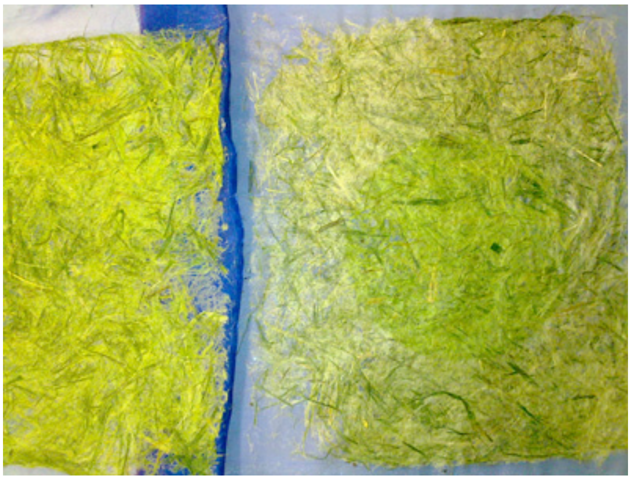
After 12 days – 27.11.12 – photo below

After 25 days - 10.12.12 – photo below

After 52 days – 7.1.13 – photo below

2. paper from fresh soft grass collected on the path behind the house, cooked 1.5h, left to stand 0.5h, washed in running water 0.5h, beaten, screened, **wet**: masked with thin round aluminium (baking tray), sandwiched between papermaking screens (=backing not light tight) 16.11.12 evening – 10.12.12 **24 days**

after 3 days - 19.11, photo below, modified into light-tight backing change visible at this stage, in the photo comparison with sheet of same paper kept in the dark



after 5 days - 21.11.12 – photo below, strong tonal change

after 7 days - 23.11.12 – photo below– change more pronounced

After 11 days – 27.11.12 – photo below -

after 17 days - 3.12.12 – photo below

After 24 days – 10.12.12 – photo below

3. same paper as above but dried 2 days in the beater room (no natural light), **dry**: masked with strip of cardboard, cardboard backing, 19.11.12 evening – 10.12.12 **23 days**

after 2 days - 21.11.12 – photo below left, light change of tone

after 4 days - 23.11.12 – photo below right, change more visible

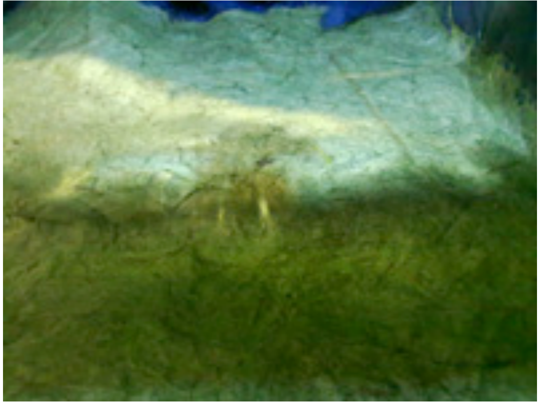
After 8 days - 27.11.12 – photo below

After 14 days – 3.12.12 – photo below

After 23 days – 10.12.12 – photo below

IN-CAMERA 2: large **10cm diameter lens** 31cm focal length

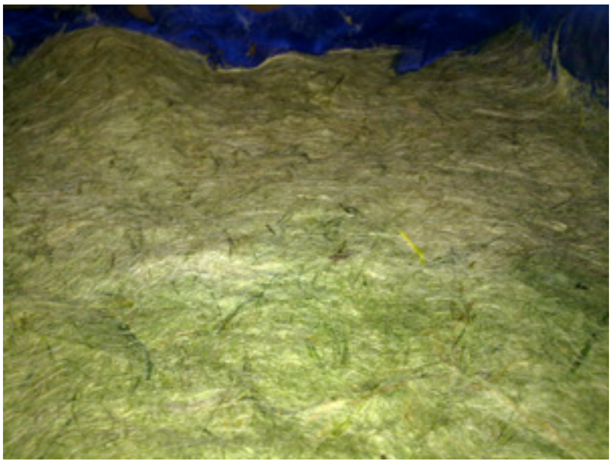
- Fresh grass sheet made the same day, straight into camera (wet)
- Box camera, not light-tight, with 3x magnification lens 100mm diameter, no aperture
- In papermaking studio, facing the roundabout (NW)
- 23.11.12 – 11.2.13 **79 days**
- **after 7 days**, on 1.12.12 morning - comparison of the paper itself (left, with lens covered), and the paper during exposure (right, with lens uncovered)



- **after 16 days**, on 10.12.12 – below left, and **after 43 days**, on 7.1.13 – below right

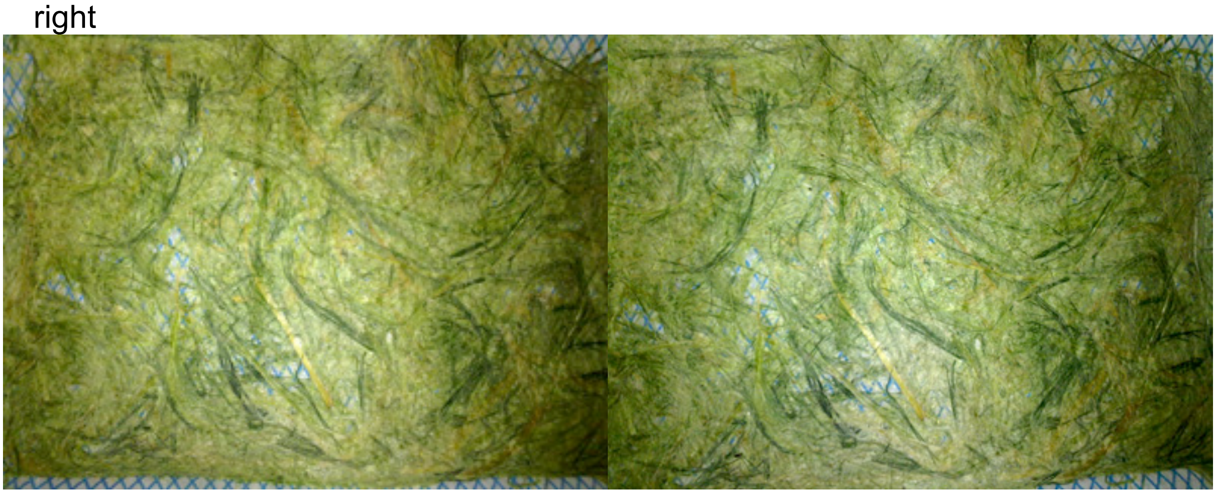
- the progress of exposure, compared to a contact print (comparison with examples 2 and 3 above, where the paper has been made from a similar grass), is at least 10 times slower (40 days equal to approximately 3 days of contact printing); this means that to achieve a good image with the light available in Newcastle in winter an exposure of some 200 days would be desired

- after **73 days** – 5.2.13 – below left; after **79 days** – below right



IN-CAMERA 3: large **10cm diameter lens** ~28 focal length

- fresh grass sheet made the same day, straight into camera (wet)
- box camera, not entirely light-tight, with 3x magnification lens 100mm diameter, no aperture, lens positioned horizontally with a mirror over it at a 45 degree angle
- In papermaking studio, facing the roundabout (initially facing SW, but changed to NW <1 day after setting up)
- 1.12.12 – 22.2.13 **after 81 days**
- **after 10 days** – 10.12.12 - photo below left, **after 37 days** – 7.1.13 – photo below right



- **after 64 days** – 5.2.13 – photo below left, **after 81 days** – 22.2.13 – photo below right

- the approximate view through the lens

IN-CAMERA 4 **20x26.5cm Fresnel lens** ~34cm focal length

- green grass A4 sheet made some 2 months ago, kept away from light
- camera: wooden construction - fixed position of lens board (30x35cm) in relation to board on which the paper rests (lens has extremely shallow depth of field), front and back panel held together with strips of wood, sides covered with cardboard
- In papermaking studio, facing north
- 18.1.13 – 4.2.13 **16 days**
- **after 16 days** – 4.2.13

IN-CAMERA 5 **20x26.5cm Fresnel lens** ~34cm focal length

- fresh grass sheet made: 45min cooking with a lot of sod.carb., dried overnight out of daylight (5.2.13)
- facing the same view as ‘in-camera 3’ (photo above); 6.2.13 – 27.2.13
- sun hole burned on the last day by setting sun
- **after 21 days**:

IN-CAMERA 6 **20x26.5cm Fresnel lens** ~34cm focal length

- fresh grass sheet made: ~1h cooking with a lot of sod.carb., dried overnight out of daylight (21.2.13)
- facing the same view as ‘in-camera 3’ and ‘5’ (photo above); 22.2.13 – 27.2.13
- sun hole burned on the last day by setting sun
- **after 5 days:**

IN-CAMERA 7 **20x26.5cm Fresnel lens** ~34cm focal length

- fresh grass sheet made: ~1h cooking with a lot of sod.carb., dried overnight out of daylight (21.2.13)
- facing north, the same N-facing view as ‘in-camera 4’ (photo above); 27.2.13 – 5.4.13
- **after 38 days:**

IN-CAMERA 8 20x26.5cm Fresnel lens ~34cm focal length

- fresh grass sheet made: soaked ~20h, ~1h cooking with sod.carb., inserted wet into camera
- facing north, the same N-facing view as 'in-camera 4' (photo above); 5.4.13 – 23.4.13
- **after 18 days**

(about the right level of exposure)

ADDITIONAL SENSITIZING WITH GRASS EXTRACT:

9

- green grass sheet, made 5.4.13, kept in the dark
- **Caparol** sized (most of the surface), dried on table in daylight
- Brushed with **fresh** grass juice extracted with a blender, dried on table in daylight
- Stored in black bag
-

10

- Old grass sheet – light yellow – no sizing
- **Caparol** sized, dried on table in daylight
- Brushed with **fresh** grass juice extracted with a blender, dried on table in daylight
- Stored in black bag
- **EXPOSED** in bedroom window in a correx camera with 28.5cm focal length Fresnel lens 26.4.13-22.5.13 – photo below
- (Caparol made the sheet almost transparent in places? Surface-brushed grass juice slow to expose and produces images no sharper than green grass paper – is this partly due to the Fresnel lens?)

11

- Old grass sheet – light yellow – no sizing
- **Caparol** sized, dried on table in daylight
- Brushed with **fresh** grass juice extracted with a blender, dried on table in daylight
- Stored in black bag

12

- Old square grass sheet (broad-leafed grass batch 2) – light yellow
- Rice starch (rice blended, cooked 2h) sized, dried on table in daylight
- Brushed with grass juice extracted with a blender **the previous day** (fridge-stored), dried on table in daylight and in light-tight box

13

- THIN green grass (fibres left from blending for juice in a blender) made 23.4.13, dried in blender room
- Rice starch (rice blended, cooked 2h) sized, dried on table in daylight; repeated
- Brushed with grass juice extracted with a blender 2 days before (fridge-stored), dried on table in daylight

14

- THIN green grass (fibres left from blending for juice in a blender) made 23.4.13, dried in blender room
- Rice starch (rice blended, cooked 2h) sized, dried on table in daylight; repeated
- Brushed with grass juice extracted with a blender 2 days before (fridge-stored), dried on table in daylight

15

- THICK green grass (fibres left from blending for juice in a blender) made 23.4.13, dried in blender room
- Rice starch (made by Evi, rice blended, cooked 2h) sized, dried on table in daylight
- Brushed with grass juice extracted with a blender 2 days before (fridge-stored) while still damp from sizing, dried on table in daylight; repeated when dry

Appendix 12. Making plant paper and exposing it using light-sensitivity of pigments naturally present in the sheets, working on-site (final body of works) (Nairs, Switzerland, May – Sep 2013)

1.5.13
Val Chöglias → Piz Fenga Pitschna, 1800m a.s.l. NWN

- fresh green grass, pan not too full, ~1 tablespoon of soda
- cooked slowly (Brennpaste in yeast can, pan rested on stones ~5cm above top of can) 1h (cooking time less)
- washed 1min, water absorbed and squeezed out a few times
- beaten 1min, mushy
- screened (not covering the whole screen, irregular), pressed by hand against a stone
- wet into camera – correx, 10cm diameter round lens, 28cm focal length, built around with stones which immobilize the construction, squeezing it slightly; black foil top, taped
- collected 11.5.13 5:30pm = **10 days exposure**
- total **41 sunshine hours** according to Meteo Swiss Office

4.6.13
Lais da Pesch → Piz Pisoc, 1750m a.s.l. S (SES)

- fresh green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~2cm above top of can) 1h (cooking time less)
- washed 5min, in running water - stream
- beaten 4min, quite tough but beating reduced it to the right state
- screened (covering the whole screen), pressed only a little with fingers

- wet paper on fabric fixed to back correx panel, and then sides, front of camera and black foil on top attached – correx, 10cm diameter round lens, 28cm focal length, built around with stones a little bit, not really immobilized very well; exact image projected onto paper not checked
- collected 12.6.13 5:30pm = **9 days exposure = 58 h sunshine** (not so successful – the top part has folded and obscured most of the sheet; looks like it's been eaten by some bugs/ants?)

thinking about the right timing for collecting grass in particular places/altitudes – now fresh grass and blooming flowers present at the altitude just above Ftan, but not at Motta Naluns (info from a woman called Karin met on the way); this changes very quickly – at Lais da Pesch old grass also visible, but new grass already present. Monitor this closely and choose places accordingly.

6/7.6.13
Lai Nair (W of, on the stream) → Piz Minschun, 1550m a.s.l. (N)

- fresh (bright) green grass (tougher variety), pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can) 1h (cooking time less)
- washed 5min, in running water – stream; GRASS LOST IN THE STREAM (filmed until screen construction) ALL REPEATED ON 7.6.13 with softer grass (cooking time ~1h) repeated stuff not filmed
- beaten 2min, beaten to right consistency quickly
- screened (covering almost the whole screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides, front of camera and black foil on top attached – correx, 10cm diameter round lens, 28cm focal length, put

under a small pine tree, built around the base with stones a little bit, not really immobilized very well; exact image projected onto paper not checked
- checked 14.6.13 – **camera gone**

not much fresh grass yet present; thinking of putting the camera under a bush or a tree with low branches (hiding it because its a popular area); being more careful and specific with choosing location so that all the parameters – grass, stone for cooking and beating, water for screening, and place for camera building/hiding – are present, also careful about filming to get the best shots (repeating when necessary); not hurrying/being comfortable with the location as part of 'tuning' into it (think: Abram; ideally would spend a night there? – not just get to know the place to find the 'best shot' i.e. visually, although this is a part of it, but in its tactile/material dimension/texture/weave)

9.6.13
Val Plavna → Piz Stabelchod, 1940m a.s.l. SES

- very little/short fresh green grass available, pan almost full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can) 1h (cooking time ~40min)
- rinsed in running water – stream, water squeezed out a few times
- beaten 2min, quite tough but beating reduced it to the right state
- screened (covering part of the screen), pressed only a little with fingers
- wet paper on fabric fixed to back correx panel, and then sides, front of camera and black foil on top attached – correx, 10cm diameter round lens, 29cm focal length, built around with stones a bit to immobilize it; exact image projected onto paper not checked
- collected 17.6.13 circa same time = **8 days exposure** = **70h** of sunshine

still some snow fields on the path up; grass very very short, although ground looks green from afar; probably the top altitude limit of available grass at this time

not only horizon but also a snow field visible as a light streak (initially mistaken for a river)

exposed for 4h in daylight (one window in the Gross Keller Atelier) during the open studios 23.6.13

12.6.13
Muott 'Auta → Piz Minschun, 2070m a.s.l. NEN

- fresh green grass available, but a bit tough, pan almost full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can) - cooking time ~30min
- rinsed in running water – stream, water squeezed out a couple of times (no real clean water in the pond – green and full of bugs)
- beaten 1.5min, not cooked and not beaten enough
- screened (covering part of the screen), pressed with correx and with fingers
- wet paper on fabric fixed to back correx panel, and then sides, front of camera and black foil on top attached – correx, 10cm diameter round lens, 28cm focal length, just set on a flat rock, NOT built around with stones to immobilize it; exact image projected onto paper not checked
- collected 21.6.13 5:30pm = **9 days exposure = 81h sunshine** (camera overturned, paper exposed to light – although tonal difference still visible; paper and backing burned by the sun)

17.6.13
Val Zuort → Piz Zuort, 1720m a.s.l. S

- fresh green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~3cm above top of can, well built-around with stones to isolate and protect from wind) - cooking time ~50min
- rinsed in running water – stream, water squeezed out a couple of times
- beaten 1.5min, cooking was enough to make it very soft, not much beating necessary
- screened (covering part of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides, front of camera and black foil on top attached – correx, 10cm diameter round lens, 28cm focal length, set on a rocky surface facing slightly upwards, built around with stones to immobilize it; exact image projected onto paper not checked
- collected 24.6.13 3:30pm = **7 days exposure** (too long – shadows too light) = **45h** of sunshine

3.7.13
Val Zuort → Piz Zuort, 1720m a.s.l. S
2nd take (not filmed)

- fresh green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can, well built-around with stones to isolate and protect from wind) - cooking time much >1h (stopped before Brennpaste ended)
- rinsed in running water – stream, water squeezed out a couple of times
- beaten ~1.5min, cooking was enough to make it very soft, not much beating necessary
- screened (covering part of the screen due to strong river currents), not pressed
- wet paper on fabric fixed to back correx panel, and then sides, front of camera and black foil on top attached – correx, 10cm diameter round lens, 28cm focal length, set on a rocky surface facing decidedly upwards, built around and from the inside with stones to immobilize it; exact image projected onto paper checked
- collected 9.7.13 1pm = **6 days exposure** = **h** of sunshine (not enough contrast in the scene?)

21.6.13
Val Urschai → Piz Faschalba, 2120m a.s.l. NE

- fresh, mostly tough, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can, well built-around with stones to isolate and protect from wind) - cooking time >1h
- rinsed in running water – stream, water squeezed out a few times
- beaten 2min, cooking was enough to make it soft, beating reduced it to the right state
- screened (covering almost all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set among rocks, river flowing on both sides, built around with stones to immobilize it; image projected onto paper checked, black foil on top attached
- checked 25.6.13 3pm – tonal difference very slight (after approx. 2 sunny and 2 cloudy days) – left for longer
- collected 1.7.13 2:30pm = **10 days exposure = 36h sunshine**

FEEDBACK + THOUGHTS after open ateliers 23.6.13
- Indicate more what the 'image' depicts? – by putting a photograph next to it, or by writing/marking 'sky', 'mountain', 'river' next to the object? (both too didactic? How to make the film perform this function better?)
- Look into conservation of plant colours (Christian knows someone who researches this) – this could fix the image*
- Christian's idea: exhibit each work in the place of its making so that one can see the same view that is in the photographic object from the window (of a cabin/pavilion etc.)
- Plants as strongly connected with light and its effects

*use mordants, especially copper (cupric) sulfate (have it? Use with citric acid in equal amounts?; it might turn the whole sheet green – if so, try alum – should be neutral) that preserves greens (recipe from 1897 on HD, with glycerin and formalin – maybe those not necessary?) ammonia or vinegar (after mordant?) might also bring out colours? how to apply it? Spray?

25.6.13
Val d'Urezzas → Piz Urezzas / Jamspitz, 2150m a.s.l. NW

- fresh, mostly soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can, well built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – stream, water squeezed out a couple of times
- beaten 2min, cooking was enough to make it soft, beating reduced it to the right state
- screened (covering almost all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set among rocks at the river, built around with stones to immobilize it; image projected onto paper checked, black foil on top attached
- collected 1.7.13 1:30pm = **6 days exposure = 18h sunshine**

26.6.13
Cruschetta → Lorenziberg, 2320m a.s.l. SES

- fresh, relatively soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can, well built-around with stones to isolate and protect from wind) - cooking time <1h (not all Brennpaste burned)
- rinsed in water – lake, water squeezed out a couple of times
- beaten 2.5min, cooking did not make it entirely soft, but longer beating reduced it to the right state
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set under a small pine tree, front raised with stones, immobilized mostly by tree branches; image projected onto paper checked, black foil on top and back attached
- collected 4.7.13 11:30am = **8 days exposure**

30.6.13
Lai da Juata → Muntet, 2240m a.s.l. E

- fresh, relatively soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can, built-around with stones a bit to isolate and protect from wind) - cooking time 1h (not enough; pan removed before all Brennpaste burned)
- rinsed in water – lake, water squeezed out a couple of times
- beaten 3min, cooking did not make it entirely soft, but longer beating reduced it to the right state
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set under a tree and fixed to branches with tape, immobilized only by tree branches; image projected onto paper not checked in detail, black foil on top, back and bottom attached
- collected 10.7.13 5:30pm = **10 days exposure**

4.7.13
Val Sesvenna → Piz d'Immez, 1900m a.s.l. NEN

- fresh, relatively soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h?
- rinsed in water – river, water squeezed out a couple of times
- beaten 3min, cooking did not make it entirely soft, but longer beating reduced it to the right state
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks and

some wood, foil on top and below, fixed to wood below tape, not otherwise immobilized; image projected onto paper checked

- collected 12.7.13 9:30am = **7.5 days exposure**

SET CAMERAS IN DIRECTION OF SUNRISE OR SUNSET FOR BEST CONTRAST?
BLACK FOIL AT THE BOTTOM TO PREVENT LIGHT LEAKS?

10.7.13
Pass da Costainas → Piz Madlain, 2280m a.s.l. NWN

- fresh, relatively soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in little can – too narrow, burns too slowly - pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time >1h?
- rinsed in water – lake, water squeezed out a few times
- beaten 3min, cooking did not make it soft enough, beating could not help much? (grass felt dry when beating and was falling apart)
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked
- checked 16.7.13 1:30pm = **camera overturned, paper gone**

12.7.13
Val Sesvenna (near Fuorcla Sesvenna) → Piz d'Immez, 2530m a.s.l. NW

- fresh, relatively soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – river/snow melt pond, water squeezed out a few times
- beaten 1.5min, cooking made it soft enough
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked (snow field in lower part of image the brightest); black foil on top only
- checked 24.7.13 11:30pm = **camera overturned, paper gone**

24.7.13
Val Sesvenna (near Fuorcla Sesvenna) → Piz d'Immez, 2530m a.s.l. NW **take 2.**

- fresh, partly soft, partly harder, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~3cm above top of can, built-around with stones to isolate and protect from wind) - cooking time 1h
- rinsed in water – river/snow melt pond, water squeezed out a few times
- beaten 1.5min(?), cooking made it soft enough
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper NOT checked; black foil on top and bottom and back (holes)
- collected 6.8.13 5:30pm = **12 days exposure**

14.7.13
Lai Blau / Lai Grisch (Val Tuoi) → Piz Fliana, 2660m a.s.l. NWW

- Lai Blau: fresh, tough, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can - full, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- Lai Grisch: rinsed in water – lake, water squeezed out a few times
- beaten 4min, cooking did not make it soft enough, beating not very good
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked (snow field in lower part of image the brightest); black foil on top only
- collected 25.7.13 12:30pm = **11 days exposure**

14.7.13
Furcletta (Val Tuoi) → Piz Buin (or Plan Rai S of), 2510m a.s.l. W

- fresh, rather tough, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~30min (end of Brennpaste)
- rinsed in water – river/snow melt water, water squeezed out a few times
- beaten 2.5min, cooking did not make it soft enough, after beating moderately good
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked; black foil on top and bottom
- collected 25.7.13 2:30pm = **11 days exposure**

16.7.13
Fuorcla Sassalba → Piz Terza, 2620m a.s.l. E

- fresh, soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~40min (end of Brennpaste)
- rinsed in water – lake water, squeezed out a few times
- beaten 2min, not quite cooked and beaten enough, but grass was soft
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked; black foil on top and bottom
- collected 30.7.13 11:30am = **14 days exposure, camera overturned, paper present**

20.7.13
Lai da la Mezza Glüna (Macun Lakes) → Piz Macun, 2630m a.s.l. NEE

- fresh, soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~3cm above top of can, built-around with stones to isolate and protect from wind) - cooking time 1h
- rinsed in water – lake water, squeezed out a few times
- beaten 1min, cooked well, not much beating necessary
- screened (covering most of the screen), not pressed
- wet paper on fabric fixed to back foamboard panel, and then sides and front of camera attached – foamboard, rigid Fresnel lens, set on rocks immobilized by surrounding with rocks; image projected onto paper checked; black foil on top only
- checked 28.7.13 12:30pm = **camera gone**

31.7.13
Fuorcla Davo Lais/Dieu (W of) → Piz Fenga (Fluchthorn), 2600m a.s.l. NW

- fresh green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten 1min, cooking and beating made it soft enough
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked; black foil on top and bottom
- collected 12.8.13 4:30pm = **12 days exposure**

31.7.13
Aua da Gondas → Piz Larain, 2470m a.s.l. NW

- fresh green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten 1min, cooking made it soft enough, short beating enough
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, 11cm diameter round lens (~35cm focal length) and correx with paper immobilized with rocks, top and sides covered with two layers of black foil, taped; image projected onto paper checked (might have moved when fixing)

- checked 12.8.13 3:30pm = **camera unmoved, paper inside gone (eaten by animal?)**

1.8.13
Fuorcla Val Gronda (Fuorcla Fenga Pitschna) (W of) → Paraid Naira (Gemspleisspitze), 2730m a.s.l. W

- fresh green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten 2min, cooking did not make it soft enough, after beating moderately good
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, and then sides and front of camera attached – correx, 10cm diameter round lens, 28cm focal length, set under a rock, immobilized by surrounding with rocks; image projected onto paper checked; black foil on top and bottom
- collected 12.8.13 2:30pm = **11 days exposure**

1.8.13
Zeblas (Zeblasjoch, E of) → Samnaun, 2460m a.s.l. E

- fresh, tough, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten 1min15s, cooking did not make it soft enough, after beating moderately good
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, 11cm diameter round lens (~35cm focal length) and correx with paper immobilized with rocks, top and sides covered with two layers of black foil, taped; image projected onto paper NOT checked
- collected 12.8.13 1:30pm = **11 days exposure**

3.8.13
Tiral (Fuorcla Champatsch) → Val Laver / Piz Tschuetta, 2590m a.s.l. NE

- fresh, tough, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time >1h
- rinsed in water – lake, water squeezed out a few times
- beaten gently 1min, cooking did not make it soft enough, after beating moderately good
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, sides and front of camera attached – correx and 11cm diameter round lens (~35cm focal length), immobilized with rocks, top and sides covered with two layers of black foil, taped; image projected onto paper checked
- collected 12.8.13 6:30pm = **9 days exposure**

3.8.13
Davo Lais → Val Laver / Muttler, 2660m a.s.l. E

- fresh, tough, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten gently 2.5min, cooking did not make it soft enough, after beating moderately good
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, sides and front of camera attached – correx and 11cm diameter round lens (~35cm focal length), immobilized with rocks, top and sides covered with two layers of black foil, taped; image projected onto paper checked
- collected 12.8.13 6:00pm = **9 days exposure, camera moved pointing upwards (double sun burn and no horizon line)**

5.8.13
Fuorcla Sesvenna, lake E of → Rassasspitz, 2770m a.s.l. NE

- fresh, soft, green grass, pan very full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten 2.5min, not beaten enough (cooking was enough)
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, sides and front of camera attached – correx and 11cm diameter round lens (~35cm focal length), immobilized with rocks, top and sides covered with two layers of black foil, taped; image projected onto paper checked
- collected 20.8.13 12:00pm = **15 days exposure, paper folded onto itself, no image**

18.8.13
Winterlücke, unter Flüela Wisshorn, lake E of → Jörigletscher, 2750m a.s.l. E

- fresh, soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time >1.5h
- rinsed in water – lake, water squeezed out a few times
- beaten 2.5min, cooked enough, beating quick
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, sides and front of camera attached – correx; 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper NOT checked (snow fields/glacier in the image, possibly – purposefully - no horizon – following Stefan's suggestion); black foil on top and bottom
- collected 4.9.13 1:30pm = **17 days exposure, paper folded onto itself, multiple small burn holes, some image**

18.8.13
Jörisee, E one → Jöriflesspass, 2520m a.s.l. E

- fresh, soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1.5h
- rinsed in water – lake, water squeezed out a few times
- beaten 2.5min, NOT cooked or beaten enough
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, sides and front of camera attached – correx; 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked, black foil on top and bottom
- collected 4.9.13 2:30pm = **17 days exposure, multiple burn holes**

22.8.13
Fuorcla Radönt, W of → Vadret da Radönt, 2700m a.s.l. SW

- fresh, soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1.5h
- rinsed in water – lake, water squeezed out a few times
- beaten 2.5min, cooked enough, beating quick
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed directly vertically to a rock surface, sides and front of camera built around it; 11cm diameter round lens (~35cm focal length), immobilized with rocks, top and sides covered with black foil, taped; image projected onto paper checked (no sky in the image only the glacier)
- collected 4.9.13 11:30pm = **13 days exposure, top of paper was not covered by black foil upon collection (bleached)**

22.8.13
Fuorcla Radönt, W of → Vadret da Radönt und Piz Radönt, 2700m a.s.l. S

- fresh, soft, green grass, pan full, ~1 tablespoon of soda
- cooked (Brennpaste in Wasabi can, pan rested on stones ~1cm above top of can, built-around with stones to isolate and protect from wind) - cooking time ~1h
- rinsed in water – lake, water squeezed out a few times
- beaten 2.5min, cooked quite enough, beating quite quick
- screened (covering roughly all of the screen), not pressed
- wet paper on fabric fixed to back correx panel, sides and front of camera attached – correx; 10cm diameter round lens, 28cm focal length, set on rocks immobilized by surrounding with rocks; image projected onto paper checked, black foil on top and bottom (in the image both the glacier and the sky with the outline of the peak)
- collected 4.9.13 11:30pm = **13 days exposure**